

# PHYSICAL AND MENTAL COMORBIDITIES AMONG EMPLOYEES WITH BIPOLAR DISORDER: ANALYSIS OF MAJOR DIAGNOSTIC CATEGORIES

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## Abstract

**Objectives:** To compare the costs associated with physical and mental comorbidities among employees with and without bipolar disorder.

**Methods:** Retrospective analysis of a database comparing healthcare service utilization and costs for employees with and without bipolar disorder in 2001–2002. The Agency for Healthcare Research and Quality (AHRQ) 17 Major Diagnostic Categories (MDCs) were used to define physical and mental comorbidities. *t*-tests were used to test statistical differences in these categories of costs between the cohorts.

**Results:** Data were available for 761 people with bipolar disorder and 229,145 people without bipolar disorder to explore the costs of comorbidities. All categories, with the exception of the Perinatal and Pregnancy categories, were associated with higher costs for the bipolar disorder cohort. Differences for 7 of the 17 MDCs were statistically significant ( $P \leq 0.05$ ). MDCs that were significantly different for persons with bipolar disorder included (mean additional costs for persons with bipolar disorder in parentheses): Mental Disorders including bipolar disorder (\$1993); Injury and Poisoning (\$390); Musculoskeletal/Connective Tissue (\$356); Other Conditions (\$151); Respiratory System (\$118); Nervous System/Sensory Organs (\$114); and Pregnancy/Childbirth/Puerperium (-\$68).

**Conclusions:** Patients with bipolar disorder have significantly more costly comorbidities than do patients without bipolar disorder, including comorbidities that are more physical than mental in nature.

## Introduction

Bipolar disorder is a severe, chronic disorder characterized by alternating manic and depressive episodes, interspersed with periods of apparently normal mood.<sup>1</sup> The frequent changes in mood episodes are a source of morbidity, disability, and mortality, and represent significant direct and indirect costs, including increased use of medical services and pharmacotherapy as well as lost productivity<sup>2</sup>

Patients with bipolar disorder commonly have coexistent psychiatric morbidities. Approximately 65% of patients with bipolar I or II disorder have a comorbid axis I disorder, most frequently anxiety or substance use disorder<sup>3</sup>

Physical health impairment is also common in bipolar disorder patients, including an increased frequency of metabolic abnormalities such as obesity and diabetes mellitus<sup>4,5</sup>

Understanding the economic impact of these comorbidities is important to planning effective healthcare for patients with bipolar disorder

## Objective

To compare the costs associated with physical and mental comorbidities among people with and without bipolar disorder

## Methods

### Data Sources

- Claims, payroll, and demographic data from the Human Capital Management Services Research Reference Database (HCMS RRD), and covering the period January 31, 2001 through December 31, 2002, were examined retrospectively to compare costs for coexisting conditions in employees with and without bipolar disorder
- The database included information on more than 230,000 employees with medical and prescription drug coverage and who worked for several large US-based employers in retail, service, manufacturing, and financial industries

### Cohort Selection and Index Dates

- Bipolar disorder cohort: patients with a diagnosis of bipolar disorder, based on criteria stipulated in *International Classification of Diseases, Ninth Revision (ICD-9)*
- Nonbipolar disorder cohort: all patients without a diagnosis of bipolar disorder
- The index date for the cohort with bipolar disorder was a subject's first diagnosis in 2001 and for the nonbipolar disorder cohort was the average index date from the bipolar disorder cohort in 2001

### Data Analysis

- Using health insurance claims, costs of medical services and prescription pharmaceuticals used by patients in each cohort were collected
- Within the two cohorts, the costs were assigned to categories using the Agency for Healthcare Research and Quality (AHRQ) 17 Major Diagnostic Categories (MDCs)
- For both cohorts, means were calculated for the annual cost per person associated with each MDC
- Cost and utilization were compared for statistical differences using *t*-tests ( $P \leq 0.05$ )

## Results

- In 2001, 761 employees (0.3%) with bipolar disorder and a control group of 229,145 employees without bipolar disorder were identified
- The demographic features of the employee cohorts with and without bipolar disorder are presented in **Table 1**
- Employees with bipolar disorder were older, more often female, less often married, and more often Caucasian than controls. Also, employees with bipolar disorder had more tenure and were more often full-time employees
- Comorbidity costs for the 761 employees with and the 229,145 employees without bipolar disorder are presented in **Table 2**
- All categories, with the exception of the Perinatal and Pregnancy/Childbirth/Puerperium categories, were associated with higher mean costs for the bipolar disorder cohort
- Differences for 7 of the 17 MDCs were statistically significant ( $P < 0.05$ ), as shown in **Figure 1**

**Table 1. Demographic Features of Employees With and Without Bipolar Disorder**

	Employees With Bipolar Disorder (n=761)			Employees Without Bipolar Disorder (n=229,145)		
	Mean	Lower 95% Confidence Limit for Mean	Upper 95% Confidence Limit for Mean	Mean	Lower 95% Confidence Limit for Mean	Upper 95% Confidence Limit for Mean
Age at index date <sup>†</sup> (years)*	41.2	40.5	41.8	40.4	40.4	40.5
Tenure at index date <sup>††</sup> (years)*	10.6	10.0	11.3	9.8	9.7	9.8
Annual salary <sup>‡</sup>	\$47,351	\$45,685	\$49,017	\$48,468	\$48,072	\$48,864
Female (%)*	54.4	50.9	57.9	44.5	44.3	44.7
Married <sup>§</sup> (%)*	46.2	42.4	49.9	56.0	55.8	56.2
Caucasian <sup>  </sup> (%)*	83.5	79.6	87.5	65.1	64.8	65.3
Black (%)*	9.1	6.0	12.2	21.3	21.1	21.5
Hispanic (%)*	4.1	2.0	6.2	8.0	7.8	8.1
Exempt (%)*	21.2	18.2	24.1	27.3	27.1	27.5
Full-time (%)*	89.1	86.9	91.3	85.7	85.6	85.8

Due to incomplete data:

<sup>†</sup>Age data are based on 229,127 employees without bipolar disorder

<sup>††</sup>Duration of employment at time of diagnosis within timeframe

<sup>‡</sup>The salary data are based on 760 employees with and 225,641 employees without bipolar disorder

<sup>§</sup>The percent married data are based on 676 employees with and 206,343 employees without bipolar disorder

<sup>||</sup>The racial data are based on 340 employees with and 152,124 employees without bipolar disorder

\* $P \leq 0.05$ , comparison of cohorts with and without bipolar disorder

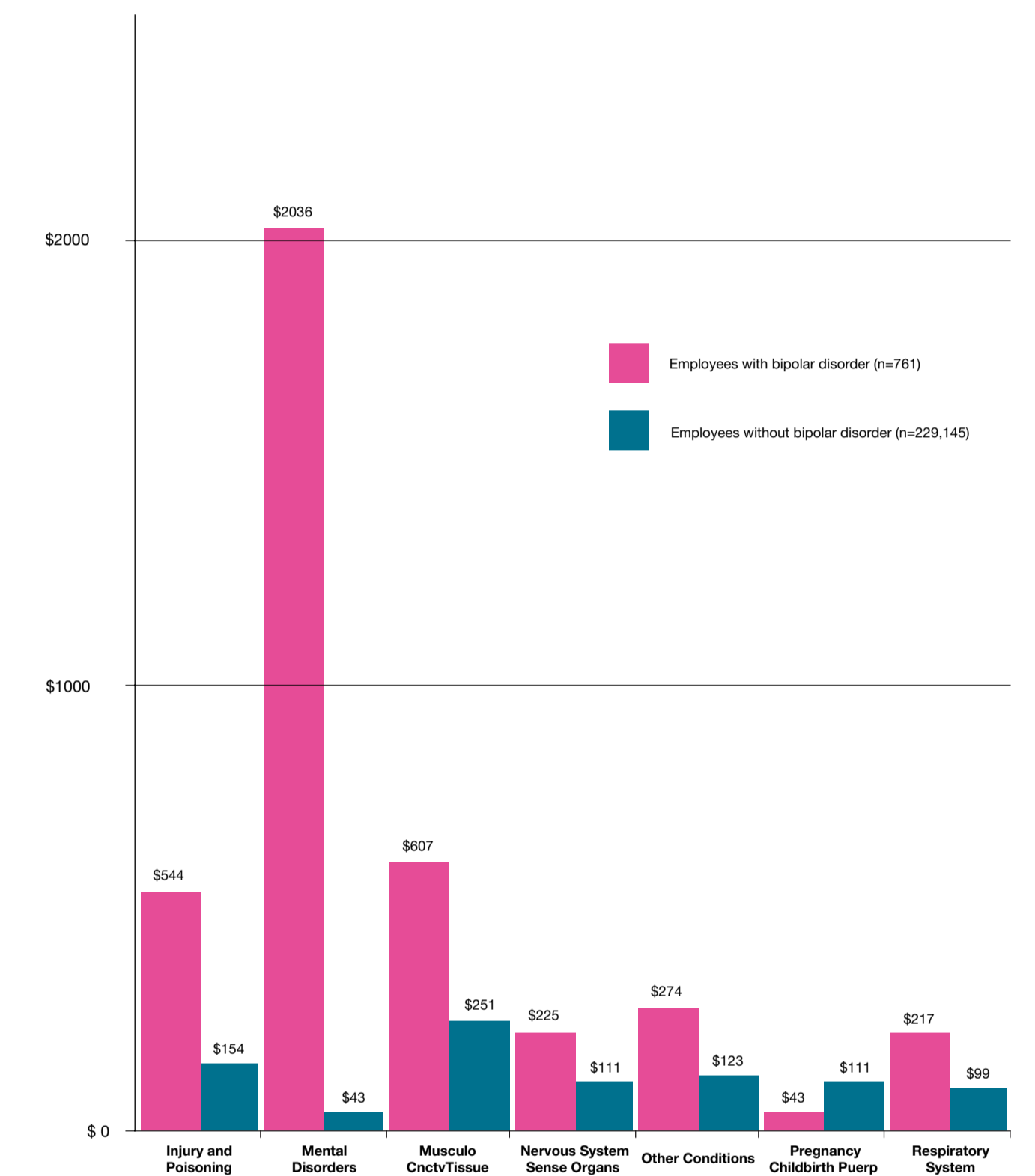
**Table 2. Mean Comorbidity Costs Per Person Within Cohort by AHRQ MDCs**

Agency for Healthcare Research and Quality Major Diagnostic Category	Employees With Bipolar Disorder (n=761)		Employees Without Bipolar Disorder (n=229,145)	
	Mean	% of total	Mean	% of total
Blood and Blood Forming Organs	\$15	0.3	\$13	0.8
Circulatory System	\$490	9.0	\$205	11.8
Congenital Anomalies	\$11	0.2	\$8	0.5
Digestive System	\$320	5.9	\$157	9.0
Endocrine/Nutritional/Metabolic/Immune	\$143	2.6	\$72	4.1
Genitourinary System	\$189	3.5	\$153	8.8
Infectious and Parasitic Disease	\$64	1.2	\$22	1.3
Injury and Poisoning*	\$544	10.0	\$154	8.9
Mental Disorders <sup>†</sup> *	\$2036	37.5	\$43	2.5
Musculoskeletal/Connective Tissue*	\$607	11.2	\$251	14.4
Neoplasms	\$206	3.8	\$169	9.7
Nervous System/Sensory Organs*	\$225	4.1	\$111	6.4
Other Conditions*	\$274	5.0	\$123	7.1
Perinatal Period	\$1	0	\$3	0.2
Pregnancy/Childbirth/Puerperium*	\$43	0.8	\$111	6.4
Respiratory System*	\$217	0	\$99	5.7
Skin and Subcutaneous Tissue	\$49	1.0	\$47	2.7
Total health care costs	\$5434	100	\$1741	100

\* $P \leq 0.05$ , comparison of cohorts with and without bipolar disorder

<sup>†</sup>Includes bipolar disorder

**Figure 1. Mean annual medical cost per person by significant MDCs ( $P < 0.05$ )**



## Conclusions

- Patients with bipolar disorder have significantly more costly comorbidities than do patients without bipolar disorder, including comorbidities that are more physical than mental in nature
- Caring for patients with bipolar disorder requires a focus on total health management, not just on the patient's mental health

## References

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