Pharmacologic Treatment of Posttraumatic Stress Disorder Among Privately Insured Americans

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Objective: Although psychological trauma affects millions of Americans, few studies have examined treatment of posttraumatic stress disorder (PTSD) in real-world service environments. This study explored pharmacological treatment of PTSD among privately insured individuals. _Methods:_ Data were from the MarketScan database, which compiles claims from private health insurance plans nationwide. Descriptive statistics and multivariate logistic regression were used to identify predictors of any use of a psychotropic medication and use of three medication classes: antidepressants, anxiolytics or sedative-hypnotics, and antipsychotics. _Results:_ Of 860,090 adult mental health care users in 2005, only 10,636 (1.2%) had a diagnosis of PTSD. Sixty percent of PTSD patients received any psychotropic medication: 74.3% of those received antidepressants, 73.7% received anxiolytics or sedative-hypnotics, and 21.3% received antipsychotics. Greater likelihood of any medication use was associated with greater use of mental health services and with several comorbid psychiatric disorders. Having a comorbid diagnosis of an indicated disorder was the most robust predictor of use of each of the three medication classes: major depressive disorder and dysthymia were most strongly associated with antidepressant use, schizophrenia and bipolar disorder were associated with antipsychotic use, and anxiety disorders were associated with use of anxiolytics or sedative-hypnotics. _Conclusions:_ Psychotropic medications were frequently used in the treatment of PTSD among privately insured clients. Although use targeted specifically to PTSD and to comorbid disorders was common, substantial use appeared to be unrelated to diagnosis and may be targeted at specific symptoms rather than diagnosed illnesses. Further research is needed to determine symptom-specific responses to medications across diagnoses. (**Psychiatric Services** 59:1184–1190, 2008)

Psychological trauma affects millions of people around the world each year, as either victims or witnesses, through many forms of exposure, such as brutal physical attacks, residence or military service in a war zone, and deadly car accidents. In 2006 in the United States alone, 42,642 people were killed in motor vehicle crashes and 2,575,000 were injured (1). It is also estimated that about 302,100 women and 92,700 men in the United States are forcibly raped each year (2). Many other individuals are the victims of other forms of violence, either in their homes (for example, child and spouse abuse) or on the streets (for example, murder, robbery, and assault).

The disorder that is most commonly associated with exposure to psychological trauma is posttraumatic stress disorder (PTSD). Although many individuals are affected by PTSD, research on the efficacy of pharmacological and psychological treatment for PTSD is inconsistent. Most recently, the Institute of Medicine (IOM) published a report on the treatment of PTSD among veterans that concluded, "[T]he scientific evidence on treatment modalities for PTSD does not reach the level of certainty that would be desired for such a common and serious condition among veterans" (3). The IOM committee found that exposure therapy is the only treatment for PTSD with sufficient evidence to support its efficacy.

Even though evidence supporting medication treatment of PTSD is limited, a recent study showed that it is provided to over 80% of patients treated for PTSD in the Department of Veterans Affairs (VA) health care system and that substantial numbers of these patients receive antidepressants (89%), anxiolytics or sedative-hypnotics (61%), or antipsychotics (34%) (4). No current literature is available on the prevalence of pharmacologic treatments of PTSD in the general population. The study report-

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ed here was designed to better apply methods developed in the VA study to the treatment of PTSD among privately insured Americans.

Although data on the effectiveness of psychotropic medications in the treatment of PTSD are limited and in some cases inconclusive, psychotropic agents have come to play an increasing role in the treatment of nonpsychotic mental illness among both children and adults (5–8). Some studies have suggested that antidepressants can be effective in treating PTSD; however, this evidence appears to be weaker among war veterans than in other populations (9–12). There is also some evidence that other psychotropic medications may be efficacious in treating war-related PTSD or at least in addressing some of the accompanying symptoms; these include anxiolytics (13–16), antipsychotics (17–20), and the alpha-1 adrenergic blocker prazosin, a generic antihypertensive agent (21,22). Both anxiolytics and sedative-hypnotics are often used to facilitate sleep and diminish hyperarousal in PTSD.

Although research on the treatment of PTSD has increased in recent years, few studies of PTSD treatment in a real-world service environment have been conducted. This study explored use of various psychotropic medications in the treatment of patients diagnosed as having PTSD. The study used a national database of psychotropic prescriptions provided to privately insured individuals between January 1, 2005, and December 31, 2005. We believe that empirical study of medication treatment of PTSD in usual practice can reveal unrecognized patterns of care that may be informative or at least deserving of further study. We thus followed a novel research strategy in which data on real-world practice were explored as a potential guide for future research (23).

In addition to determining the proportions of patients who were receiving various agents, we further sought to identify specific sociodemographic characteristics and comorbid diagnoses associated with use of various classes of medication to determine whether these treatments were being used specifically to treat PTSD or rather to treat comorbid psychiatric disorders.

Methods

Data source

Data for this study were obtained from MEDSTAT's MarketScan database. This database compiles claims from private health insurance plans nationwide and includes information on adults and their dependents insured through the benefit plans of large employers. The 2005 data represent about four million covered lives. MEDSTAT collects the claims data, standardizes their formats, and aggregates them in a single file. Information about the specific firms participating in the national database is unavailable for reasons of confidentiality. More than 200 insurance companies contribute claims information to the database, which represents approximately 3% to 4% of the U.S. population with employer-sponsored health care. The MarketScan database thus provides access to a large sample of privately insured adults and children with mental disorders.

Although the database is not necessarily representative of the general population, because it does not include claims data for Medicaid beneficiaries or uninsured persons or for patients who elect to pay for their treatment themselves, it permits a rare glimpse of health care service use in a national sample of privately insured adults. Because this study analyzed data from a public-access database without identifiers, it did not require institutional review board approval or informed consent.

It has been estimated that 83% of Americans had some type of private or public health insurance coverage in 1996 (24). About 68% had private health insurance, and 15% were covered by Medicare, Medicaid, or other public sources. The remaining 17% were uninsured. Sixty-one percent of the population in 1996 had employment-related coverage of the type represented in the MarketScan database. In 1996 employment-based coverage represented more than 89% of all private insurance, and 69% of persons under age 65 were covered by such insurance; 12% were covered by public insurance, and 19 percent were uninsured (24).

Sample characteristics

In calendar year 2005, among all individuals covered by plans contributing to the MarketScan database, 1,060,937 adults or children received service for a psychiatric diagnosis. From this group we identified 860,090 adults (age 18 and older). Among these adult users of mental health care, 10,636 (1.2%) had a diagnosis of PTSD. As shown in Table 1, the most common comorbid diagnosis in the group with PTSD was major depression (22.7%), followed by dysthymia or mild depression (21.1%) and anxiety spectrum disorders (18.3%).

Measures

Diagnostic groups. ICD-9 codes were used to identify the following nonmutually exclusive comorbid diagnoses: PTSD, major depressive disorder, anxiety disorders, bipolar disorder, dysthymic disorder or mild depression, alcohol abuse or dependence, drug abuse or dependence, and schizophrenia. We recorded both primary and secondary diagnoses reported on each mental health service claim.

Insurance plans. We defined two major types of insurance plans: one more restrictive and the other less restrictive. The restrictive group included health maintenance organizations and point-of-service plans, which require patients to have a referral from a primary care physician to gain access to a specialist. There are also strong financial incentives for patients to choose providers and facilities associated with the programs.

Table 1

Comorbid psychiatric disorders among 10,636 persons with posttraumatic stress disorder

Disorder	N	%
Anxiety disorder	1,944	18.3
Major depression	2,411	22.7
Dysthymia	2,243	21.1
Bipolar disorder	775	7.3
Schizophrenia	209	2.0
Alcohol use disorder	223	2.1
Drug use disorder	217	2.0

The group of plans with less restrictive coverage included preferred-provider organizations (PPOs) and health savings accounts (HSAs). In both of these types of programs covered individuals have access to a specialist without a primary care physician's referral. However, in PPO plans there are some financial incentives to choose a provider from within the plan, such as a reduced copayment for visits. No restrictions or limitations are associated with HSAs, which function as a tax-deferred savings account for medical care.

Mental health visits. Visits that were associated with a primary psychiatric diagnosis on insurance claims forms (*ICD-9* codes 290.00–319.00) were counted as mental health visits.

General medical visits. Visits that were not associated with a psychiatric diagnosis were considered medical visits.

Days in treatment. Days in treatment were calculated as the number of days between the first and last insurance claim for any psychiatric diagnosis during the 2005 calendar year. We used this measure to adjust for differences in retention rates among covered individuals within the observed time period.

Psychotropic medications. First, medications were classified into three general subgroups: antidepressants, including tricyclic antidepressants (TCAs), monoamine oxidase inhibitors (MAOIs), and selective serotonin reuptake inhibitors (SSRIs); anxiolytics or sedative-hypnotics, including benzodiazepines and other drugs classified as anxiolytics or sedative-hypnotics; and antipsychotics, including both first- and second-generation antipsychotics. Next, we examined the use of seven subgroups of psychotropic medication: second-generation antipsychotics, first-generation antipsychotics, mood stabilizers, SSRIs, TCAs, MAOIs, anxiolytics, and sedative-hypnotics. [A list of all psychotropic medications identified in the study is available as an online supplement to this article at ps.psychiatryonline.org].

Statistical analyses

First, we examined the frequency with which patients with a diagnosis of PTSD were prescribed any medication and each specific medication class at any time in the year. We next compared the characteristics of individuals who did and did not receive any psychotropics. Using bivariate lo-gistic regression, we then explored separately the association of each independent variable with use of any medication and with each of the three broad classes of medication. Next, we used multivariate logistic regression to identify both patient characteristics and measures of service use that were independently associated with receipt of any psychotropic medication and, among such users, with each of the three medication subclasses.

Results

Overall, of the 860,090 adult mental health care users in the 2005 database, 10,636 (1.2%) were diagnosed as having PTSD. Sixty percent of the individuals with PTSD were prescribed psychotropic medication during the observed treatment period (Table 2). Women were more than one-and-a-half times as likely as men to receive pharmacological intervention. Older patients were also more likely to receive prescriptions. In the bivariate analyses all comorbid psychiatric conditions were associated with an increased likelihood of receiving any psychotropic medication. The largest effects were observed among patients with PTSD and a comorbid diagnosis of bipolar disorder (odds ra-

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Table 2

Sociodemographic and clinical characteristics associated with prescription of any psychotropic medication among 10,636 persons with posttraumatic stress disorder

Characteristic	Any psychotropic (N=6,386; 60%)		No psychotropic (N=4,249; 40%)		OR	95% CI	p
	N	%	N	%			
Female (reference: male)	4,583	71.8	2,595	61.1	1.62	1.49–1.76	<.001
Diagnosis (reference: without indicated diagnosis)							
Anxiety disorder	1,403	22.0	541	12.7	1.93	1.73–2.15	<.001
Major depression	1,860	29.1	551	13.0	2.76	2.48–3.06	<.001
Dysthymia	1,557	24.4	686	16.1	1.68	1.52–1.85	<.001
Bipolar disorder	641	10.0	134	3.2	3.43	2.83–4.15	<.001
Schizophrenia	156	2.4	53	1.2	1.98	1.45–2.71	<.001
Alcohol use disorder	144	2.3	79	1.9	1.22	0.92–1.61	.164
Drug use disorder	165	2.6	52	1.2	2.14	1.56–2.93	<.001
Less restrictive insurance plan (reference: more restrictive plan)[a]	5,326	85.2	3,358	86.9	.87	.77–.97	.01
Age (M±SD)[b]	43.54±11.80		42.45±12.83		1.07	1.04–1.10	<.001
Mental health visits (M±SD)[b]	13.76±14.75		7.65±15.50		1.39	1.35–1.43	<.001
General medical visits (M±SD)[b]	23.25±26.08		17.79±21.74		1.10	1.08–1.12	<.001
Days in treatment (M±SD)[b]	281.24±86.42		250.6±103.37		1.03	1.03–1.04	<.001

[a] Less restrictive plans included preferred-provider organizations and health savings accounts. More restrictive plans included health maintenance organization and point-of-service plans.
[b] Visits and days in treatment are for 2005. Odd ratios represent the odds of medication prescription for each ten units.

tio [OR]=3.43), major depression (OR=2.76), or a drug use disorder (OR=2.14).

Individuals who received psychotropic medications also had more mental health and medical visits than those who did not receive medications. On average, patients who received medications had 13.8 mental health visits and 23.3 medical visits, compared with only 7.7 and 17.8 visits, respectively, among patients who did not receive pharmacological intervention.

Individuals who were covered by less restrictive health insurance plans were less likely (OR=.87) to be prescribed a psychotropic medication than individuals covered by more restrictive plans (that is, a plan that requires a referral from a primary care physician to a specialty mental health provider).

As shown in Table 3, among the 6,386 patients who were prescribed psychotropic medications, 74.3% received an antidepressant, 73.7% received anxiolytics or sedative-hypnotics, and 21.3% received antipsy-

chotics. Bivariate logistic regression indicated that age was associated with a greater likelihood of being prescribed an anxiolytic or sedative-hypnotic but not an antidepressant or antipsychotic. Compared with men, women were more likely to receive antidepressants (OR=1.46) and anxiolytic or sedative-hypnotic medications (OR=1.26).

As shown in Table 3, comorbid major depression and dysthymia were most strongly associated with use of antidepressants. Drug abuse and anxiety disorder were most strongly associated with receipt of anxiolytics or sedative-hypnotics. Schizophrenia and bipolar disorder were most strongly associated with use of antipsychotics.

Older patients and women were more likely to be prescribed antidepressants and anxiolytics or sedative-hypnotics but not antipsychotics. Patients covered by less restrictive insurance plans were less likely to be prescribed antipsychotic medications. Patients with more mental health visits during 2005 were more

likely to receive prescriptions in all medication categories (Table 3). More medical visits were associated with use of anxiolytics or sedative-hypnotics and also with use of antipsychotic medications.

As Table 4 shows, analyses that included all significant independent variables associated with use of each type of medication largely confirmed the bivariate findings. Prescription of antidepressant medication was associated with female gender, diagnoses of major depressive disorder and dysthymia, and more mental health visits. Antidepressant prescription was less likely among patients with a comorbid diagnosis of anxiety disorder. Prescription of anxiolytics or sedative-hypnotics was associated with age, female gender, comorbid anxiety disorder, and more mental health and medical visits. Finally, prescription of antipsychotics was significantly associated with bipolar disorder, schizophrenia, major depressive disorder, and more mental health visits. In multivariate models patients with PTSD who also had bipolar disorder

Table 3

Bivariate logistic regression predicting use of specific drug classes among 6,386 persons with posttraumatic stress disorder who received any psychotropic medication

	Antidepressants (N=4,746; 74.3%)					Anxiolytics or sedative hypnotics (N=4,706; 73.7%)					Antipsychotics (N=1,363; 21.3%)				
	Yes		No			Yes		No			Yes		No		
Variable	N	%	N	%	OR	N	%	N	%	OR	N	%	N	%	OR
Female	3,503	73.8	1,080	65.9	1.46**	3,437	73.0	1,146	68.2	1.26**	968	71.0	3,615	72.0	.95
Anxiety disorder	1,090	23.0	313	19.1	1.26**	1,174	24.9	229	13.6	2.11**	376	27.6	1,027	20.4	1.48**
Major depression	1,567	33.0	293	17.9	2.27**	1,469	31.2	391	23.3	1.50**	602	44.2	1,258	25.0	2.37**
Dysthymia	1,283	27.0	274	16.7	1.85**	1,155	24.5	402	23.9	1.03	412	30.2	1,145	22.8	1.47**
Bipolar disorder	498	10.5	143	8.7	1.23	513	10.9	128	7.6	1.48**	384	28.2	257	5.1	7.27**
Schizophrenia	112	2.4	44	2.7	.87	118	2.5	38	2.3	1.11	113	8.3	43	.9	10.47**
Alcohol use disorder	108	2.3	36	2.2	1.04	116	2.5	28	1.7	1.49	50	3.7	94	1.9	2.00**
Drug use disorder	131	2.6	34	2.1	1.34	143	3.0	22	1.3	2.36**	83	6.1	82	1.6	3.91*
Less restrictive insurance plan[a]	3,939	84.9	1,387	86.0	.91	3,918	85.0	1,408	85.7	.93	1,122	83.4	4,204	85.6	.84**
Age (M±SD)[b]	43.70±11.69		43.08±12.09		1.04	44.09±11.47		42.01±12.54		1.15	43.38±11.90		43.58±11.78		.99
Mental health visits (M±SD)[b]	15.85±15.54		7.74±9.97		1.07	15.84±15.55		7.92±10.16		1.07	23.87±18.53		11.02±12.18		1.06
General medical visits (M±SD)[b]	23.24±26.59		23.26±24.53		1.00	24.91±27.61		18.58±20.51		1.01	24.32±28.68		22.95±25.32		1.01
Days in treatment (M±SD)[b]	284.34±84.80		272.25±90.20		1.02	285.85±82.90		268.31±94.30		1.02	292.16±79.80		278.27±87.91		1.02

[a] Reference: more restrictive plan. Less restrictive plans included preferred-provider organizations and health savings accounts. More restrictive plans included health maintenance organization and point-of-service plans.
[b] Visits and days in treatment are for 2005. Odd ratios represent the odds of medication prescription for each ten units.
 *p<.01
**p<.001

Table 4

Multivariate logistic regression predicting use of specific drug classes among 6,386 persons with posttraumatic stress disorder who received any psychotropic medication

Variable	Antidepressants (N=4,746; 74.3%)			Anxiolytics or sedative-hypnotics (N=4,706; 73.7%)			Antipsychotics (N=1,363; 21.3%)		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Age	—[a]			1.01	1.01–1.02	<.001	—[a]		
Female	1.30	1.10–1.80	<.001	1.17	1.02–1.33	.02	—[a]		
Anxiety disorder	.65	.55–.76	<.001	1.36	1.15–1.60	<.001	.67	.56–.80	<.001
Major depression	1.64	1.41–1.90	<.001	1.03	.89–1.18	.73	1.74	1.51–2.02	<.001
Dysthymia	1.56	1.34–1.82	<.001	—[a]			1.06	.91–1.25	.43
Bipolar disorder	—[a]			.95	.76–1.18	.64	5.39	4.46–6.53	<.001
Schizophrenia	—[a]			—[a]			5.23	3.46–7.92	<.001
Alcohol use disorder	—[a]			—[a]			.59	.37–.92	.021
Drug use disorder	—[a]			.94	.57–1.54	.80	1.20	.81–1.78	.37
Less restrictive insurance plan[b]	—[a]			—[a]			.85	.70–1.03	.11
Mental health visits[c]	1.07	1.07–1.08	<.001	1.07	1.06–1.08	<.001	1.06	1.05–1.07	<.001
General medical visits[c]	—[a]			1.01	1.01–1.02	.001	—[a]		
Days in treatment[c]	.99	.99–1.00	.017	.99	.998–.999	.03	.99	.998–.999	.001

[a] Variable not in the model

[b] Reference: more restrictive plan. Less restrictive plans included preferred-provider organizations and health savings accounts. More restrictive plans included health maintenance organization and point-of-service plans.

[c] Visits and days in treatment are for 2005. Odd ratios represent the odds of medication prescription for each ten units.

or schizophrenia were more than five times as likely as patients without these comorbid diagnoses to receive antipsychotic medications.

Discussion

A nationally representative, face-to-face household survey estimated that approximately 6.8 million American adults age 18 and older, or about 3.1% of the adult population, have PTSD. However, we found the treated prevalence of PTSD in this privately insured, and thus presumably economically better off, sample of adults was only 1.2%. It has also been estimated that about 10.5% of Medicaid beneficiaries have a diagnosis of PTSD. These higher rates likely reflect the fact that people who have significant disabilities or low incomes, such as those covered by Medicaid, are more often exposed to violence and domestic abuse than individuals with private insurance and are thus more likely to be given a diagnosis of PTSD.

Among patients with PTSD in this privately insured population, 60% were given a prescription for psychotropic medications. Among these, almost equal proportions were given a prescription for antidepressants (74.3%) or anxiolytics or sedative-hypnotics (73.7%), and 21.3% received prescriptions for antipsychotic medications. In comparison, data from the VA indicate substantially higher rates of pharmacological intervention (4). In the VA study 80% of veterans with a diagnosis of PTSD received psychotropic medications; in this group, 89% were treated with antidepressants, 61% were treated with anxiolytics or sedative-hypnotics, and 34% were treated with antipsychotics (4).

More than a decade ago, it was reported that only 25% of PTSD patients covered by Medicaid in New Hampshire were treated with antidepressants and 20% were treated with second-generation antipsychotic medications (25). These rates are far lower than those observed either in the VA or in this privately insured sample. The proportion of PTSD patients covered by Medicaid who were treated with antipsychotics in 1999 (20%) is higher than the proportion treated with antipsychotics in 2005 in our privately insured sample (13%). However, in 1999 only 25% of PTSD patients covered by Medicaid in New Hampshire were treated with SSRIs (both sertraline and paroxetine had Food and Drug Administration [FDA] approval for use with PTSD at that time) compared with 45% of PTSD

patients in our sample. This increase is consistent with findings from other studies that have shown that SSRIs have increasingly become the first-line pharmacological intervention for both mood and anxiety spectrum disorders in recent years. In addition, some SSRIs have recently been approved by the FDA for treatment of PTSD. These medications are now widely prescribed by both specialists and primary care providers (6,8).

Overall, the strongest correlates of use of specific medications were indicators of clinical severity, such as comorbid psychiatric diagnoses and more extensive use of both specialty mental health and medical services. It is especially notable that in the analyses of each of the three medication classes, clinically relevant comorbid diagnoses were especially robust predictors of medication prescriptions. Major depressive disorder and dysthymia were most strongly associated with antidepressant use, schizophrenia and bipolar disorder were most strongly associated with antipsychotic use, and anxiolytics or sedative-hypnotics were most strongly associated with anxiety disorders. These findings are very similar to those of a recent study of patients treated in the VA health care system (4), which is no-

table because VA patients are older and far more likely to be male, to be disabled, and to have been exposed specifically to war-zone trauma.

Medications not formally approved by the FDA for treatment of PTSD appear to have often been used appropriately to treat comorbid psychiatric conditions. However, there was notable use of antipsychotics among patients without comorbid psychotic conditions. Among the patients who received any medications, 21.3% received a prescription for an antipsychotic, whereas the rate of comorbid diagnosis of schizophrenia and bipolar disorder among medication users was only 2.4% and 10.0%, respectively. More specifically, among patients who received antipsychotics, 16.2% did not have a comorbid diagnosis of either schizophrenia or bipolar disorder, the only conditions for which these agents are approved by the FDA.

Although it is impossible to determine from administrative data the clinical rationale for prescribing antipsychotic medications, the most likely explanation may be that off-label use of these drugs was intended to target symptoms associated with either PTSD itself or with comorbid psychiatric illnesses, such as sleep disturbances. These prescribing practices may reflect recent literature suggesting that antipsychotics are effective in the treatment of PTSD (26–31). However, there is also a growing concern associated with the increasing proportion of patients prescribed antipsychotics who do not have an indicated condition (32). Objective diagnostic tests are not available for any psychiatric disorders, and many symptoms emerge across a wide range of disorders. Without interviewing the prescribers, the rationale for these prescriptions cannot be determined.

The most important limitation of this study is that we relied entirely on administrative claims data and on diagnoses that were more likely to be based on clinicians' judgment rather than on formal assessment tools. Moreover, the relatively low prevalence of PTSD in this privately insured sample may reflect a tendency to underdiagnose PTSD. An-

other limitation related to our reliance on administrative claims data is that we cannot tell which diagnosis was the primary diagnosis from the perspective of the treating clinician. However, as noted above, among PTSD patients who did not have a comorbid diagnosis of either schizophrenia or bipolar disorder, 16.2% received antipsychotic medications, which suggests an intention to use these agents to treat some patients' PTSD.

Conclusions

Although this study was focused on the treatment of PTSD among privately insured adults, it draws attention to the broader issue of off-label prescription of psychotropic medications. There is considerable overlap in symptoms across psychiatric diagnoses as defined by *DSM-IV*, and thus treatment may often be directed at specific symptoms rather than at specific diagnoses.

The results of this study suggest that even though medication choices are significantly associated with indicated diagnoses, they not entirely determined by diagnosis. Although we lack data on the clinical thinking behind the observed patterns of prescription drug use, it seems likely that some prescribing is symptom driven rather than diagnosis driven and that future research should examine the efficacy of symptom-specific drug interventions either within or across a range of diagnoses.

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