

# Epidemiology of Emergency Department Visits for Anxiety in the United States: 2009–2011

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**Objective:** The purpose of this study was to describe the epidemiology of anxiety-related emergency department (ED) visits in the United States and assess the care provided during those visits.

**Methods:** Data from the 2009–2011 National Hospital Ambulatory Medical Care Survey were used to identify all ED visits in which the patient received a primary anxiety diagnosis or declared anxiety as the reason for the visit (N=1,029). Patient characteristics, treatment provided, and dispositions of these nationally representative visits were assessed.

**Results:** There were an estimated 1,247,000 anxiety-related ED visits annually, representing .93% of all ED visits. The proportion of total ED visits that were anxiety related was higher among women than men (1.05% versus .77%) and among nonelderly adults (1.28%) versus other age groups, non-Hispanic whites (1.06%) versus other racial-ethnic groups, and

self-pay visits (1.20%) versus other forms of insurance. Among anxiety-related visits, a small percentage (9.6%) involved admission to the hospital, and approximately 67% involved a referral back to the patient's medical care professional. Regarding content of care, most visits for anxiety involved diagnostic or screening services, and one-fourth involved medical procedures. Anxiolytics and benzodiazepines were prescribed most often when drug therapy was offered during anxiety visits in the ED.

**Conclusions:** EDs were frequently used by patients experiencing anxiety symptoms. In the vast majority of visits, follow-up visits with providers were planned. The most common treatment provided during these ED visits was benzodiazepines, which can offer immediate anxiety symptom relief but are potentially dangerous because of risk of overdose and addiction.

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Anxiety disorders are the most common class of mental disorders in the U.S. population, with an estimated 12-month and lifetime prevalence of 19% and 31%, respectively (1). Large U.S. prevalence studies estimate that anxiety disorders affect 15.7 million people each year and 30 million people at some point in their lives (2). Possibly because anxiety is associated with acute somatic symptomology, anxiety disorders are frequently treated in the emergency department (ED) as well as in primary care or mental health care settings (2,3). The most common anxiety disorders are generalized anxiety disorder and panic disorder. Several studies have documented that panic disorder is the most common reason for seeking treatment for noncardiac chest pain (NCCP) at the ED (4–8). ED evaluations and management are expensive, and patients with anxiety disorders tend to present for multiple ED visits (9,10). One study found that 50% of patients with panic disorder sought treatment at the ED on six or more occasions, with the first ED visit recurrence within seven days in 16.6% of the cases (11).

It is clear that effective management strategies for anxiety disorders are needed, within both primary care and emergency care. Left untreated, anxiety disorders can result in

the use of expensive ED visits, exacerbating the economic burden that mental health care places on the health care system. People with anxiety disorders tend to be high utilizers of health care and place a strain on the health care system. It is estimated that annual health care costs for anxiety disorders reach \$42.3 billion (12). These costs could be attenuated with timely and appropriate care within the mental health care system for those diagnosed as having anxiety disorders.

Several studies have provided evidence of the underuse of effective management for anxiety disorders (6,13,14) in the ED. One study found that approximately one-third of individuals who presented to the ED with NCCP and who were ultimately diagnosed with PD received treatment for the PD (15). Few epidemiologic studies have provided documentation at the population level of the characteristics and visit disposition of patients presenting with anxiety disorders in the ED. This information is vital in order to design health service interventions that will improve clinical and health care utilization outcomes among patients with anxiety disorders. Anxiety-related visits to the ED are an optimal opportunity to prevent not only frequent reuse of the ED but

also worsening of psychiatric risk trajectories. Moreover, there is evidence of harmful overuse of benzodiazepines, a common treatment for individuals who present with anxiety disorders in the ED. Unfortunately, aside from the potential harmful effects, benzodiazepines have been shown to have only a modest effect on long-term management of anxiety and on prevention of ED reuse (11).

To better understand treatment patterns for individuals with anxiety disorders, it is necessary to assess the frequency of ED visits related to anxiety disorders, the characteristics of patients who visit the ED for anxiety-related reasons, and the content of care provided during ED visits related to anxiety disorders. Epidemiologic studies of mental health and mental health care not only provide useful information on the use of health care services but also may help in the development of treatment and prevention strategies for anxiety disorders (16). To that end, the primary purpose of this article is to describe the epidemiology of anxiety-related ED visits in the United States in order to help guide service delivery and interventional research and to generate hypotheses regarding the health care-seeking behavior of persons with anxiety.

## METHODS

Data from the 2009–2011 National Hospital Ambulatory Medical Care Surveys (NHAMCS) were used to enumerate and characterize ED visits in which anxiety was the primary reason for the visit or was the resulting primary discharge diagnosis. NHAMCS used a national probability sample of visits to the emergency and outpatient departments of general and short-stay hospitals located in the 50 states and the District of Columbia that were not affiliated with criminal, mental, or other types of institutions, excluding federal, military, and U.S. Department of Veterans Affairs hospitals (17). NHAMCS is a four-stage survey conducted by the National Center for Health Statistics at the Centers for Disease Control and Prevention (17).

Analyses included all ED visits in which the patient declared anxiety to be the primary reason for the visit or in which the provider assigned a primary discharge diagnosis of anxiety state (*ICD-9-CM* code 300.0), acute reaction to stress (308), adjustment reaction (309), phobic disorders (300.2), and obsessive-compulsive disorders (300.3). A comprehensive list of all conditions included in this study is presented in a box on page 239. A total of 1,029 visits to EDs with anxiety as the primary diagnosis or reason for the visit were identified within the 2009–2011 NHAMCS sample. All data were anonymous, and this study was exempt from review by the institutional review board of Florida State University.

## Definitions of Variables

**Demographic characteristics and insurance.** Visits were classified by sex, age, race-ethnicity, insurance type, region, and urban or rural distinction. Age was characterized as under 18, 18 to 64, and 65 and over. The four race-ethnicity groups included non-Hispanic white, non-Hispanic black,

### ANXIETY DISORDERS AND COMORBID CONDITIONS IDENTIFIED DURING 1,029 EMERGENCY DEPARTMENT VISITS FOR ANXIETY, BY *ICD-9-CM* CODE

#### Anxiety disorders

##### Anxiety states (300)

Anxiety states unspecified (300.00)

Panic disorder (300.01)

Generalized anxiety disorder (300.02)

##### Phobic disorders (300.2)

Phobia unspecified (300.20)

Agoraphobia with panic attacks (300.21)

Social phobia (300.23)

Other isolated or simple phobia (300.29)

##### Obsessive-compulsive disorder (300.3)

Anancastic neurosis (300.3)

Compulsive neurosis (300.3)

Obsessional neurosis (300.3)

##### Acute reaction to stress (308)

Predominant disturbance of emotions (308.0)

Predominant disturbance of consciousness (308.1)

Predominant psychomotor disturbance (308.2)

Other acute reactions to stress (308.3)

Mixed disorders as reaction to stress (308.4)

Unspecified acute reaction to stress (308.9)

##### Adjustment reaction (309)

Brief depressive reaction (309.0)

Prolonged depressive reaction (309.1)

With predominant disturbance of other emotions (309.2)

With predominant disturbance of conduct (309.3)

With mixed disturbance of emotions and conduct (309.4)

Other specified adjustment reactions; PTSD (309.81)

Unspecified adjustment reaction (309.9)

#### Comorbid conditions

##### Cardiovascular and respiratory

Diseases of the circulatory system (390–459)

Diseases of the respiratory system (460–519)

##### Substance abuse

Alcohol psychoses (291.0–291.9)

Drug psychoses (292.0–292.9)

Alcohol dependence (303.0–303.9)

Drug dependence (304.0–304.9)

Nondependent drug abuse (305.0–305.9)

##### Other psychiatric disorders

All mental disorders except the anxiety disorders listed above (290–319)

Hispanic, and non-Hispanic other. Insurance status was determined from the NHAMCS variable capturing the primary expected source of payment and was categorized as private, Medicaid, Medicare, self-pay (including no charge or charity), and other. Region of visit included Northeast, West, South, and Midwest. Urban or rural distinction was determined by utilizing the variable measuring metropolitan status.

**Visit disposition.** Visit disposition was categorized as no follow-up planned, instructed to consult with referring physician, admitted to the hospital or transferred to psychiatric hospital, and return if needed.

**Triage.** Triage was determined from the NHAMCS variable capturing the immediacy with which the patient should be seen. The five-category “immediacy” variable (immediate, emergent, urgent, semiurgent, and nonurgent) was recoded into the following three triage categories: immediate/emergent, urgent, and semi/nonurgent.

**Episode of care.** The NHAMCS variable “episode of care” attempts to measure the nature of the care provided at the visit and is defined as an initial visit versus a follow-up visit. The three categories included initial visit, follow-up visit, and unknown.

**Content of care.** Content of care was captured by determining whether diagnostic screening instruments (electrocardiogram and toxicology screen) were administered, whether procedures were performed, whether the patient was seen by a mental health provider, and whether drug therapy was initiated. The NHAMCS data include information on up to eight medications that were prescribed, continued, or provided during the ED visit. The four drug therapy categories examined included antidepressants, anxiolytics and benzodiazepines, narcotics, and antipsychotics and were identified by using the therapeutic class variable included in the NHAMCS. We aggregated selective serotonin reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors, and other medications used to treat anxiety and henceforth refer to them as antidepressants, as they are commonly known, even though we recognize that these medications can be used to treat many conditions other than depression. The drug therapy categories were not mutually exclusive, given that patients may have been administered more than one form of drug therapy.

**Comorbidity.** Comorbidity measures captured the frequency with which an anxiety-related visit was accompanied by any of the following three categories of comorbid conditions: respiratory and cardiovascular disorders, substance abuse, and other psychiatric disorders (see box on page 239).

## Analysis

All data analyses were performed by using SAS, version 9.4, software. The primary analysis was a descriptive summary of anxiety-related ED visits. National estimates of the number of anxiety-related ED visits were obtained by utilizing assigned patient visit weights and were rounded to the nearest thousand. We also assessed the patient and visit characteristics of all-cause ED visits to assess whether these characteristics differed from those of anxiety-related ED visits. The SURVEYFREQ procedures in SAS were used to allow for standard errors to correctly account for the complex sampling strategy.

## RESULTS

The nationally weighted estimated annual number of anxiety-related visits to the ED is presented in Table 1. A total of

1,247,000 ED visits for anxiety occurred annually between 2009 and 2011, representing .93% (95% confidence interval [CI]=.8–1.0) of all ED visits. The majority of the anxiety-related visits were by females (62%, CI=55.9–68.8), who represented a larger percentage of anxiety ED visits compared with all-cause ED visits (54.9%, CI=54.5–55.3). Non-Hispanic whites made approximately 68% (CI=61.8–75.2) of the anxiety-related ED visits, and non-Hispanic blacks and Hispanics comprised approximately 16% (CI=11.9–20.1) and 13% (CI=10.1–15.9), respectively, of the anxiety-related ED visits. The proportion of total ED visits that were anxiety related was higher among non-Hispanic whites (1.06%) compared with other racial and ethnic groups and among adults between the ages of 18 and 64 compared with other age groups (1.28%) and individuals with self-pay compared with other insurance (1.20%). The proportion of total ED visits that were anxiety related was higher in nonurban versus urban areas (1.04%) and in the Northeast (1.04%) and West (1.02%) compared with other regions of the United States. The proportion of all-cause ED visits that were anxiety related was higher among visits accompanied by substance abuse (2.85%) and other psychiatric disorders (4.48%) than among visits accompanied by cardiovascular and respiratory conditions (.24%).

Less than 10% of anxiety-related ED visits resulted in a hospitalization, and approximately 67% resulted in either being referred back to a medical care professional or being advised to return to the ED if necessary (Table 2). Seven percent of the patients did not receive directions for follow-up. Only 14% of the anxiety-related visits were categorized as immediate/emergent in terms of the immediacy with which the patient should be seen. One-third of the visits were determined to be semiurgent or nonurgent. More than 81% of the visits were initial visits, with only a small proportion being follow-up visits.

The majority (64%) of anxiety-related visits included diagnostic or screening services, and almost one-fourth (23%) included medical procedures (Table 3). A mental health specialist was seen in only 13% of anxiety-related ED visits. Medications were given or prescribed at ED discharge in 68% (CI=61.0–75.1) of anxiety-related visits. Anxiolytics and benzodiazepines (53.2%) were most often prescribed for anxiety-related ED visits when drug therapy was provided in the ED. A small minority of the study population was prescribed antidepressants (4.5%), antipsychotics (3.1%), or narcotics (5.2%) during the anxiety-related ED visit.

## DISCUSSION

Between 2009 and 2011, ED visits for anxiety (either as reason for visit or as discharge diagnosis) accounted for .93% of all ED visits. This proportion of ED visits is larger than the reported proportion of depression-related ED visits between 1997 and 2000, which was about .60% of visits (3). These results are also consistent with findings that anxiety visits

**TABLE 1. Characteristics of emergency department (ED) visits for all causes and for anxiety, 2009–2011**

Characteristic	All-cause ED visits			Anxiety ED visits			
	Sample N	Weighted annual visits	%	Sample N	Weighted annual visits	%	Comparison with proportion for all-cause ED visits (%)
Total	100,962	134,071,000	—	1,029	1,247,000	—	.93
Sex							
Female	55,031	73,565,000	54.9	635	778,000	62.4	1.05
Male	45,931	60,506,000	45.1	394	469,000	37.6	.77
Age group							
<18	22,718	30,813,000	23.0	72	83,000	6.7	.27
18–64	63,276	83,376,000	62.2	870	1,068,000	85.6	1.28
≥65	14,968	19,881,000	14.8	87	96,000	7.7	.48
Race-ethnicity							
Non-Hispanic white	59,296	80,877,000	60.3	644	854,000	68.5	1.06
Non-Hispanic black	22,596	29,832,000	22.3	169	199,000	16.0	.67
Hispanic	14,874	19,059,000	14.2	177	162,000	13.0	.85
Non-Hispanic other	4,196	4,302,000	3.2	39	31,000	2.5	.73
Insurance							
Private	28,074	40,292,000	30.0	290	368,000	29.5	.91
Medicare	17,798	23,694,000	17.7	165	196,000	15.7	.83
Medicaid	9,492	36,107,000	26.9	277	315,000	25.3	.87
Self-pay	30,123	21,544,000	16.1	189	258,000	20.7	1.20
Other	15,475	12,435,000	9.3	108	110,000	8.8	.89
Region							
Northeast	24,358	24,467,000	18.2	331	254,000	20.4	1.04
Midwest	22,524	29,865,000	22.3	188	263,000	21.1	.88
South	34,539	53,976,000	40.3	287	466,000	37.4	.86
West	19,541	25,763,000	19.2	223	264,000	21.1	1.02
Metropolitan statistical area							
Urban	87,064	111,383,000	83.1	893	1,010,000	81.0	.91
Nonurban	13,898	22,687,000	16.9	136	237,000	19.0	1.04
Comorbidity							
Cardiovascular and respiratory	19,599	26,393,000	19.7	54	63,000	5.1	.24
Substance abuse	2,836	3,314,000	2.5	80	95,000	7.6	2.85
Other psychiatric	3,296	3,200,000	2.4	149	143,000	11.5	4.48

account for a higher proportion of all mental health–related ED visits compared with visits for depression (18).

Although the distribution of payer source was similar for ED visits for anxiety and all-cause ED visits, privately insured and Medicaid recipients accounted for the largest percentage of the anxiety-related ED visits, suggesting that lack of insurance coverage is not the primary reason for ED utilization. Previous findings that rates of ED visits tend to be much higher for Medicaid recipients than for persons with private insurance (19) further support the possibility that persons with anxiety have distinctive health-seeking behavior. Perhaps individuals with undiagnosed or untreated anxiety disorders develop acute symptomatology and ultimately seek primary care within the ED. One consequence of Medicaid patients' lack of access to primary care is greater reliance on the ED (20). In addition, patients may feel a sense of urgency generated by symptoms such as anxiety, leading to particularly acute needs for immediate access to care (21).

Several findings from this study have important implications for health service interventions. The vast majority of

visits were initial visits, constituting a critical opportunity for brief interventions that may improve self-management of anxiety and decrease repeat ED visits. In addition, fewer than one in six anxiety-related visits included care by a mental health specialist. Hospital-based mental health consultation is likely to improve proper diagnosis and management (22). The common practice of providing negative test results and reassurance regarding NCCP, for example, has not been shown to affect use of ED visits among patients with anxiety disorders (23). Anxiety-focused counseling approaches may be more effective.

It is important to note that for the majority of visits, patients were prescribed anxiolytic medications. These medications have potential for abuse and overdose, have been found to have a modest effect on long-term management of anxiety disorders, and are not likely to prevent reuse of ED services. In fact, a number of studies have found that behavioral interventions, such as cognitive-behavioral therapy, are more effective than medications in the amelioration of anxiety symptoms and prevention of recurrence (24,25). Studies have shown that even very brief behavioral



**TABLE 2. Characteristics of anxiety-related visits to emergency departments, 2009–2011**

Characteristic	Weighted frequency	%	SE	95% confidence limits
Visit disposition				
No follow-up	83,000	6.7	1.3	4.1–9.2
Return/refer	83,800	67.2	3.6	60.2–74.2
Inpatient	120,000	9.6	1.1	7.5–11.7
Other	206,000	16.5	1.5	13.5–19.6
Triage				
Immediate/emergent	170,000	13.6	1.3	11.0–16.2
Urgent	641,000	51.4	3.3	45.0–57.8
Semiurgent/nonurgent	399,000	32.0	2.1	27.8–36.2
Episode of care				
Initial visit	1,014,000	81.3	4.0	73.4–89.1
Follow-up	89,000	7.2	1.0	5.3–9.1
Unknown	144,000	11.5	1.6	8.3–14.7

interventions are effective (23), as are SSRIs (26). Even the integration of an anxiety screening tool may not be feasible or effective as a diagnostic tool without the assistance of a mental health provider (27). On the basis of these findings, it seems likely that integration of mental health specialists within both ED and primary care may drastically improve clinical outcomes and reduce repeated ED visits.

According to the National Institute of Mental Health, antidepressants, antianxiety drugs, and beta blockers are the medications primarily used for treatment of anxiety disorders. Our findings demonstrate that anxiolytics and benzodiazepines were the drugs prescribed most often when drug therapy was employed in the ED. This form of drug therapy is potentially dangerous because of risk of overdose and addiction. Although this drug category may offer immediate anxiety symptom relief, physicians should exercise a high level of caution given the potential for harm. Most surprising was the finding that physicians prescribed narcotics during

a larger proportion of visits than they prescribed antidepressants. Further research is required to elucidate this potentially dangerous pattern of drug prescribing for persons with anxiety.

For individuals who are not in imminent danger, referrals to mental health specialists would be appropriate, whereas for those who are in imminent danger, admission to the hospital or transfer to a psychiatric facility would be the best course of action (3). Consistent with previous triage patterns, half of the anxiety-related visits were classified as urgent (18). Because only a small proportion of study visits were classified as immediate/emergent, the most common disposition for anxiety patients was receiving instruction to consult with the referring physician. The small proportion of immediate/emergent visits suggests that the ED—rather than mental health specialists—was the primary source of care for anxiety-related distress. Notably, 7% of the patients were not advised to make plans for follow-up. Despite the previously reported low level of compliance with referrals for follow-up (28), an appropriate level of care should nevertheless include referral to a mental health counselor or their primary care physician.

Persons from racial-ethnic minority groups may be at higher risk of developing mental disorders because of social and environmental difficulties (29). However, prevalence rates of anxiety among racial-ethnic minority groups are a more controversial topic, given that qualitative studies are more likely than quantitative studies to show an elevated level of psychological distress among racial-ethnic minority groups (30). Although anxiety-related ED visits were most frequent among non-Hispanic whites in this study, persons from racial-ethnic minority groups represented more than one-third of these visits. These findings may reflect disparities in access to outpatient mental health treatment.

Some limitations of this study should be acknowledged. The study methodology and the nature of the data set prevent making inferences regarding causation. The CDC acquires information regarding patient visits from the provider for a truncated period of time, precluding follow-up. Findings regarding medication prescriptions must be interpreted cautiously, given that the presence of other medical conditions may have necessitated these prescriptions. In addition, the study relied on patient-reported anxiety symptoms or physician discharge diagnoses and not on structured diagnostic assessments. It is possible that some of the patients who generated these visits did not meet the diagnostic threshold for an anxiety disorder. However, this study calculated rates of visits and treatment for anxiety by including only visits in which the patient or physician had identified anxiety as the primary diagnosis or reason for the visit. The purpose of this study was to present a detailed summary of ED visits for anxiety-related issues, with the specific intent to provide a foundation for future research on the health-seeking behavior of and quality of health care received by persons with anxiety disorders.

**TABLE 3. Content of care among anxiety-related visits to the emergency department, 2009–2011**

Content of care	Weighted frequency	%	SE	95% confidence limits
Screening				
Yes	803,000	64.4	3.4	57.7–71.1
No	444,000	35.6	2.3	31.0–40.2
Procedures				
Yes	289,000	23.2	2.0	19.3–27.1
No	958,000	76.8	3.8	69.3–84.3
Mental health provider seen				
Yes	159,000	12.8	1.5	9.9–15.6
No	1,088,000	87.2	4.4	78.5–95.9
Drug therapy <sup>a</sup>				
Anxiolytics/benzodiazepines	664,000	53.2	3.1	47.1–59.3
Antidepressants	57,000	4.5	.6	3.3–5.8
Narcotics	65,000	5.2	.8	3.6–6.7
Antipsychotics	38,000	3.1	.6	1.9–4.3

<sup>a</sup> Drug therapy groups are not mutually exclusive.

Most important, it is possible that this study did not capture all visits to the ED for anxiety-related reasons, and therefore the rates presented are likely underestimates. To control for potential undercounting, we also included “reason for visit” in an attempt to include as many anxiety-related ED visits as possible. Despite these efforts, it is probable that this study underestimated the number of visits. For example, the attending physician may not have recognized the symptoms as being related to anxiety and may have attributed the symptoms to another condition and treated the patient accordingly. In addition, the patient may not have recognized that the symptoms—for example, chest pains—were related to anxiety and, therefore, may not have reported anxiety as the reason for the visit to the ED. The majority of patients who seek emergency care for acute chest pain are released from the ED with noncardiac diagnoses, given that chest pain is a common symptom of certain psychiatric disorders (31). Recognizing the potentially treatable anxiety disorders that are highly concurrent with somatic symptoms, therefore, is important. Missed anxiety-related visits highlight the need for better screening for anxiety in the ED and better training to care for persons with anxiety.

## CONCLUSIONS

Despite its limitations, this study represents the first attempt to specifically quantify the burden of anxiety in a representative national sample of U.S. ED visits. The use of the ED for anxiety-related visits suggests that the diagnosis of anxiety either is not caught or is left untreated in primary care and that further work is needed to ensure access to outpatient mental health care, where appropriate care of anxiety is more likely. This study also provides a detailed description of the characteristics of ED visits for anxiety in terms of content of care and visit disposition and provides a comprehensive foundation for future research to address the health care-seeking behavior of persons with mental health issues.

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