

# Anxiety disorders: Dental implications

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Anxiety disorders are the most frequently found psychiatric problem in the general population. The most common anxiety disorders are phobias, panic attack, generalized anxiety disorder, post-traumatic stress disorder and acute stress disorder. Recent terrorist attacks in the U.S. have had a marked impact on the mental health status of individuals directly affected by the attacks as well as those who were far from the scenes of destruction. To provide effective dental care, the dentist must be able to identify anxious patients and deal with their anxiety. This process may involve referring the patient for medical evaluation and treatment of very severe cases of anxiety. In most cases, the dentist can manage the patient by using behavioral and/or pharmacologic means.

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Anxiety is a sense of psychological distress that may not have a focus. It is a state of apprehension that may involve the following (either alone or in combination): an internal psychological conflict, an environmental stress, a physical disease, or the effect of a medicine or drug. While anxiety can manifest as a purely psychological experience with few somatic manifestations, it also can appear as a purely physical experience (for example, tachycardia, palpitations, chest pain, indigestion, and headaches) with no psychological distress other than concern about the physical symptoms. It is not clear why some individuals experience anxiety as a psychological manifestation while others experience it in physically.<sup>1</sup>

## Epidemiology: Incidence and prevalence

Anxiety disorders constitute the psychiatric problem diagnosed most frequently in the general population. Simple phobia is the most common anxiety disorder, although panic disorder is the most common among people seeking medical treatment. Approximately 9.0% of the population experiences at least one panic attack during their lives and approximately 3.0% have recurrent panic attacks.<sup>1,2</sup>

A *phobia* is defined as an irrational fear that interferes with normal behavior. Phobias are fears of specific objects, situations, or experiences that have taken on a symbolic meaning for the patient; both unconscious wishes and fears have been displaced from an original goal onto an external object.<sup>1,6</sup>

A *panic disorder* consists of a sudden, unexpected, overwhelming feeling of terror with symptoms of dyspnea, palpitations, dizziness, faintness, trembling, sweating, choking, flushes or chills, numbness or tingling sensations, and chest pains. The panic attack peaks after approximately 10 minutes and usually lasts for a total of 20–30 minutes.<sup>1,2,7,8</sup>

Panic disorder, phobic disorders, and obsessive-compulsive disorders occur more frequently among first-degree relatives of people with these disorders than among the general population.<sup>1,2</sup> The prevalence of panic disorder among cardiac patients is approximately 9.0%. Generalized anxiety disorder has a community prevalence of 2.5–5.0%; the prevalence of post-traumatic stress disorder (PTSD) among the general population is 4.0–7.0%.<sup>1,9-14</sup>

## Etiology

Anxiety represents the possible emergence of painful, unacceptable thoughts, impulses, or desires into consciousness. It may result from past and present psychological conflicts; these conflicts or feelings stimulate physiologic changes that lead to clinical manifestations of anxiety.<sup>1,15</sup> Anxiety disorders may occur among persons under emotional stress or those with certain systemic illnesses; they also may appear as a component of various psychiatric disorders. Panic disorders tend to be found in families: if one first-degree relative has a panic disorder, the chance that other relatives will develop panic disorders is approximately 18%.<sup>1,15</sup>

No single theory fully explains all anxiety disorders and there is no single biologic or psychological cause for anxiety. Anxiety might be explained as a combination of psychosocial and biological processes. The *locus coeruleus* is a brain stem structure that contains the majority of noradrenergic neurons in the central nervous system (CNS); it appears to be involved in panic attacks and anxiety. Panic and anxiety may correlate to the dysregulated firing of the locus coeruleus, resulting from multiple sources of input, including peripheral autonomic afferents, medullary afferents, and serotonergic fibers.<sup>1</sup>

Other neurobiologic theories for explaining panic attacks and anxiety include lactate infusion, benzodiazepine receptors, the amygdala, and synaptic responses from the brain. Lactate infusion causes peripheral somatic sensations resembling those of natural panic attacks. Dysfunction in the benzodiazepine receptor may be responsible for some components of anxiety. The amygdala, a brain structure that influences fear, vigilance, and rage, may play a role in anxiety by interacting with various hypothalamic and brain stem structures.<sup>1</sup>

Another theory suggests that stressors induce protein c-fos, a class of immediate early proteins that act near the beginning of the neural process and can induce long-lasting biochemical and neurobiologic changes through cascades.<sup>1</sup> States of anxiety also may be associated with other psychiatric disorders, organic diseases, the use of certain drugs, hyperthyroidism, mitral valve prolapse, and mood disorders, schizophrenia, or personality disorders.<sup>1,9,15,16</sup>

## Clinical presentation and medical management

From a psychological aspect, *anxiety* can be defined as an emotional pain or a feeling that all is not well—a feeling of impending disaster. The source of the problem usually is not apparent to the person with anxiety. Patients with fear experience a similar feeling but they are aware of the problem and why it affects them.

The physiologic reaction to anxiety and fear is the same. The reaction is mediated through the autonomic nervous system and may involve both sympathetic and parasympathetic components. Symptoms of anxiety resulting from an overactivated sympathetic nervous system include an increased heart rate, sweating, dilated pupils, and muscle tension; symptoms of anxiety resulting from stimulation of the parasympathetic system include urination and diarrhea.<sup>1</sup>

Most individuals experience some anxiety. Low levels of anxiety can increase attention and improve performance. Anxiety leads to dysfunction when it either is constant or results in episodes of extreme vigilance, excessive motor tension, autonomic hyperactivity, or impaired concentration. For many patients with psychiatric disorders, anxiety is part of the clinical picture; patients with mood disorders, dementia, psychosis, panic disorder, adjustment disorders, and toxic and withdrawal states often complain of anxiety.<sup>1</sup>

### Phobias

There are three major groups of phobias: agoraphobia, social phobias, and simple phobias. *Agoraphobia* is a fear of displaying distressful or embarrassing symptoms outside of the home; it often accompanies panic disorder. Social phobias may be specific (for example, a fear of public speaking) or general (for example, a fear of being embarrassed in front of other people). Simple phobias include the fear of snakes, heights, flying, darkness and needles. Needle phobia and claustrophobia during MRI or radiation therapy may affect medical/dental care.<sup>1,9,15</sup>

### Panic attack

Nearly 15% of cardiology patients visit a doctor because of symptoms associated with a panic attack. The onset can occur at any age but usually does so between a patient's late adolescence and their mid-30s.<sup>9</sup> The adrenergic surge is a key feature of panic and results in an exaggerated sympathetic response known as the *fight or flight response*.

Panic attacks may be cued or uncued. A fear of flying is an example of a cued attack. Many patients report that they are unaware of any life stressors prior to the onset of panic disorder; such attacks would be classified as uncued. The major

complication of repeated panic attacks involves adopting a restricted lifestyle to avoid situations that might trigger an attack. Some patients develop agoraphobia, an irrational fear of being alone in public places that can result in patients becoming housebound for years. A sudden loss of social supports or a disruption of important interpersonal relationships appear to predispose an individual to develop a panic disorder.<sup>1,2,15</sup> It has been reported that patients with a history of panic attacks have an increased incidence of mitral valve prolapse.<sup>17</sup>

### Generalized anxiety disorder

Some patients develop a persistent, diffuse form of anxiety with symptoms of motor tension, autonomic hyperactivity, and apprehension. No familial or genetic basis for the disorder exists. Patients with generalized anxiety disorder respond more favorably to treatment than those with panic disorder, although generalized anxiety disorder can lead to depression and substance abuse.<sup>1,2,15</sup>

### Post-traumatic stress disorder

*PTSD* is a syndrome of psychophysiological signs and symptoms resulting from exposure to a traumatic event outside of the usual range of human experience, such as a serious threat to one's life or physical integrity; a serious threat to one's children, spouse, or other loved ones; the sudden destruction of one's home or community; or the witnessing of an accident or act of physical violence that seriously injures or kills another person(s).<sup>1,2</sup> Most men with PTSD have been in combat; most women give a history of sexual or physical abuse.<sup>1</sup> The three cardinal features of PTSD are hyperarousal, intrusive symptoms or flashbacks of the initial trauma, and psychic numbing.<sup>1,2</sup> PTSD may follow traumatic events that are anticipated or not anticipated, constant or repetitive, natural or malevolent; it is diagnosed when the onset of symptoms occurs at least six months after a trauma or when the symptoms have been present for longer than three months.

Diagnostic criteria for PTSD includes a history of traumatic experience; re-experiencing the event through intrusive memories; disturbing dreams; "flashbacks"; psychologic or physical distress resulting from the reminders of the event; and the avoidance of people,

places, and objects associated with the trauma. PTSD symptoms include sleep problems; irritability; an inability to concentrate; hypervigilance; startle responses; psychic numbing, consisting of detachment from others; a diminished capacity for intimacy; and a decreased interest in sex.<sup>1,2,9,15</sup>

Recent terrorist attacks in the U.S. have affected the mental health status of individuals involved directly in the attacks, as well as others who were far away from the actual scene.<sup>14,18-20</sup> In a national survey of 560 adults conducted three to five days after the 2001 attacks on the World Trade Center and the Pentagon, Schuster et al found that 44% of them displayed one or more substantial symptoms of stress.<sup>19</sup> In a survey of 2,273 adults performed one to two months after the attack, Schlenger et al found that individuals in New York City displayed a prevalence for PTSD nearly three times greater than respondents from the rest of the country.<sup>14</sup> Of 414 residents of Lower Manhattan surveyed between October 25, 2001 and November 2, 2001, 39.9% displayed a potential for PTSD.<sup>21</sup> A study of stress-related illnesses among New York City Fire Department rescue workers found that 1,277 such incidents were reported in the 11 months following the attacks, compared to 75 such incidents in the 11-month period prior to the attacks.<sup>22</sup> A 2002 study of workers at a high school and a college within five miles of the World Trade Center indicated much higher rates of depression and PTSD than among people with similar jobs who worked five miles or more from the World Trade Center.<sup>23</sup>

A study following the 1995 Oklahoma City bombing examined 182 survivors six months after the bombing and 141 survivors 12 months later. Of the survivors, 33% were diagnosed with PTSD six months following the bombing; all of the cases evaluated after 18 months were chronic.<sup>18</sup>

Although women generally are diagnosed with PTSD more often than men, the rate of PTSD is higher in male veterans than in female veterans, although it is likely that female veterans are underdiagnosed.<sup>24</sup> In 2002, Pereira reported that men experienced higher levels of combat stress. In addition, Pereira found that increased PTSD symptomology was associated with increased exposure to

**Table 1.** Commonly used benzodiazepines.<sup>3</sup>

Anxiolytics
Chlordiazepoxide
Diazepam
Lorazepam
Oxazepam
Aiprazolam
Sedative-hypnotics
Flurazepam
Temazepam
Trizolam

stress and that men and women exposed to similar levels of stress were equally likely to have PTSD symptoms, although men were more likely to be diagnosed with PTSD.<sup>24</sup> Drug treatment for men and combat trauma-induced PTSD (among both men and women) is less effective than it is for other woman veterans or for women with civilian trauma-induced PTSD.<sup>25</sup> There is little data regarding the effectiveness of drug treatment among children with either acute stress reaction or PTSD.<sup>25</sup>

#### *Acute stress disorder*

Acute stress disorder is a new DSM-IV category of anxiety disorder that results when a patient is exposed to a traumatic event and has specific signs and symptoms that resemble those of PTSD.<sup>2</sup> The symptoms of acute stress disorder are shorter in duration; in addition, onset follows the trauma more rapidly and symptomatic reaction is limited to the occurrence of the stressful event and its immediate aftermath.<sup>2</sup>

#### **Treatment of anxiety disorders**

Psychologic, behavioral, and drug modalities are used to treat anxiety disorders. Psychologic treatment involves psychotherapy, which generally is used for more severe cases. Behavioral treatment includes cognitive therapy for dealing with distorted perceptions and interpretations of fear-producing stimuli, biofeedback, hypnosis, relaxation imaging, desensitization, and flooding. Drug treatment includes the use of tricyclic antidepressants, selective serotonin reuptake inhibitors (SSRIs), monoamine oxidase (MAO) in-

hibitors, beta-adrenoreceptor antagonists, and benzodiazepines, the most commonly used drugs (see Table 1).<sup>1,9,15</sup>

Treatment options for phobias include systemic desensitization, in which a patient is exposed to the feared situation gradually, and flooding, in which the patient is exposed to the anxiety-provoking stimulus directly. MRI-associated claustrophobia can be managed with a low dose of benzodiazepines and behavioral therapy.<sup>1,15</sup> Sertraline was the first and only FDA-approved medication for treating PTSD, although paroxetine, fluoxetine, and nefazodone have displayed either well-controlled or replicated open-label evidence of efficacy for treating PTSD.<sup>25</sup> Phelzine has been effective for symptoms of nightmares and flashbacks. Early intervention in patients with PTSD can shorten the duration and severity of anxiety.<sup>1,9,15</sup>

#### *Antianxiety (anxiolytic) drugs*

Benzodiazepines are used to treat the various anxiety states. These drugs enhance gamma-aminobutyric acid neurotransmission selectively but indirectly, the possible result of their ability to increase neuronal receptor sensitivity to gamma-aminobutyric acid. The benzodiazepines are the drugs of choice for generalized anxiety disorders and are very effective for treating short-lived reactive states of tension and anxiety, anticipatory anxiety and other forms of anxiety associated with panic disorders, and anxiety symptoms found in patients with phobic disorders.<sup>1,9,15,26</sup> Tricyclics and MAO inhibitors are the drugs of choice for panic disorders.

Side effects of the benzodiazepines include daytime sedation, mild cognitive impairment, and aggressive and impulsive behavior responses. The benzodiazepines can potentiate the effects of opioids, barbiturates, and alcohol on the CNS and are hazardous or contraindicated for patients who drive or operate machinery, patients with depressive mood disorders or psychosis, moderate-to-heavy drinkers, pregnant women, and the elderly. Therapeutic doses of benzodiazepines can result in a tolerance as well as a habitual and physical dependence. The benzodiazepines' actions are additive and usually synergistic with psychotropic agents. Drug interactions have been reported with cimetidine and erythromycin.<sup>1,9,15,26,27</sup>

Diazepam is the standard for antianxiety therapy, as it has demonstrated better efficacy against anxiety than any other anxiolytic drug.<sup>9</sup> These drugs often are administered for 7–10 days, followed by a period of two to three days without the drug to avoid the development of drug tolerance. Anxiolytic drug treatment should continue for no more than four weeks. An early sign of drug tolerance occurs when increased dosage is required. Symptoms of drug withdrawal include muscle aches, agitation, restlessness, insomnia, confusion, delirium, and, on rare occasions, grand mal seizures. Some patients may experience rebound anxiety after the drug treatment has been stopped.<sup>1,9,15,26,27</sup>

A number of tricyclic and other antidepressants have additional sedative or anxiolytic effects. They appear to be as effective as benzodiazepines when treating generalized anxiety and superior to benzodiazepines for treating panic disorder and agoraphobia. SSRIs and MAO inhibitors also are effective in phobic states and panic disorders. The disadvantages of these drugs include their slow rate of onset, the possibility that anxiety symptoms will be exacerbated initially, and the fact that some are toxic in overdose; even when administered in therapeutic doses, these drugs have many adverse side effects.<sup>26</sup>

#### **Dental management**

##### *Anxiety*

The dentist may detect anxiety in patients based on physical appearance, speech, dress, and the presence of certain signs and symptoms. Anxious patients display symptoms that may include sitting forward in a chair; moving fingers, arms, or legs; getting up and moving; pacing around the room; checking certain parts of clothing; and straightening ties or scarves. Conversely, they also may display sloppy dress habits and other signs that suggest the opposite of perfectionism.

Anxious patients may appear intent on trying to keep their possessions in sight at all times. They may respond to questions quickly, often preventing the dentist from finishing a question; they also may speak mechanically and rapidly and may fail to block out or connect thoughts. These patients may complain of an inability to sleep or may wake at an early hour and be unable to go back

**Table 2.** Dental management of the anxious patient.<sup>3</sup>

	<b>Behavioral management</b>	<b>Pharmaceutical management</b>
<b>Preoperative</b>	<p>Establish effective communication with the patient</p> <p>Be open and honest; let the patient see who you are</p> <p>Consistent verbal and nonverbal communication</p> <p>Explain procedures and answer any questions (explain when there may be discomfort with a procedure and what you will do to make procedures “pain-free”)</p> <p>Talk to the patient if he or she displays signs of anxiety (for example, “You seem tense today—Would you like to talk about it?”)</p>	<p>Oral sedation (benzodiazepines)</p> <p>May be administered the night before an appointment (to help the patient fall asleep) or the day of an appointment (to reduce patient anxiety); select a fast-acting drug and prescribe the lowest possible effective dosage</p>
<b>Operative</b>	<p>Allow patient to ask questions about the procedure</p> <p>Keep patient informed to expect any discomfort</p> <p>Reassure patient that the procedure is going well</p>	<p>Effective local anesthesia: oral sedation (benzodiazepines); inhalation sedation (nitrous oxide); intramuscular sedation (midazolam, promethazine, meperidine); intravenous sedation (diazepam, midazolam, fentanyl)</p>
<b>Postoperative</b>	<p>Explain what usually occurs after the procedure</p> <p>Explain what the patient needs to do and what he/she needs to avoid</p> <p>Describe complications that can occur (for example, pain, bleeding, infection, and allergic reaction to medication)</p> <p>Tell patient to inform you if any complications develop</p>	<p>Select the most appropriate medication for pain control: analgesics (including NSAIDs, salicylates, acetaminophen, codeine, oxycodone, fentanyl, morphine); adjunctive medications (antidepressants, muscle relaxants, steroids, anticonvulsants, and antibiotics)</p>

to sleep. Other signs include attacks of diarrhea, increased frequency of urination, sweating, muscle tension, increased breathing, and a rapid heart rate.

Overall, anxious persons are overalert and tense, feel apprehensive, and have a sense of impending disaster with no apparent cause. Insomnia, tension, and apprehension lead to fatigue, making it even more difficult for the individual to deal with anxiety.<sup>9</sup>

The dentist should talk with the patient and demonstrate a personal interest; verbal and nonverbal communication must be consistent. The dentist should confront the patient with the observation that he or she appears anxious and ask if the individual would like to talk about his or her feelings; this can include the patient's attitude toward the dentist. During these discussions, the dentist should allow natural pauses to develop between ideas, producing a temporary state of regression that will help restore the patient to a less-anxious state. Some patients may respond well to this approach without ever indicating the cause of their anxiety. If the patient remains anxious, the dentist may consider managing the dental treatment by

utilizing hypnosis, oxygen, and oral or parenteral sedation agents or nitrous oxide (see Table 2).

Anxiety or a history of panic attacks also may be associated with mitral valve prolapse.<sup>1,2,17</sup> Patients with mitral valve prolapse and valvular regurgitation require antibiotic prophylaxis for any dental procedures that produce significant bleeding.<sup>3,17,28</sup> Based on 1997 guidelines provided by the American Heart Association, antibiotic prophylaxis is not indicated if no regurgitation is associated with the mitral valve prolapse.<sup>28</sup> If the patient is unaware of his or her status regarding valvular regurgitation, a medical referral is indicated.<sup>3</sup>

Patients with uncontrolled hyperthyroidism also may have associated anxiety; these patients must avoid epinephrine, including even the small amounts used in local anesthetics.<sup>1,3</sup> Patients who display signs and symptoms of hyperthyroidism should be referred for medical evaluation and treatment.<sup>3</sup>

#### *Management of PTSD patients*

Veterans with PTSD may view the dentist as an authority figure, similar to those who sent them to war.<sup>29</sup> Veterans may associate dental treatment with a

loss of control; as a result, the dentist must attempt to establish communication and trust with these patients. Patients with intravenous drug habits may carry the hepatitis B virus (HBsAg positive) or HIV, while those who drink heavily may have liver and bone marrow involvement and could be at an increased risk for infection, excessive bleeding, delayed healing, and altered drug metabolism.<sup>3,29</sup> During the depressive stage of PTSD, patients often show a total disregard for oral hygiene procedures and are at an increased risk for dental caries, periodontal disease, and pericoronitis; these patients may complain of glossodynia, temporomandibular joint (TMJ) disorder, and bruxism.<sup>3,29</sup>

#### **Drug interactions and side effects**

##### *Antianxiety drugs*

Important interactions can occur between benzodiazepines and barbiturates, opioids, psychotropic agents, cimetidine, and erythromycin. These agents generally will potentiate the depressive effects of benzodiazepines on the CNS. Barbiturates and opioids used for dental sedation or pain control must

**Table 3.** Commonly used antidepressants.<sup>3</sup>

**Tricyclic derivatives**

Amitriptyline  
Nortriptyline  
Imipramine  
Desipramine  
Doxepin

**MAO inhibitors**

Phenelzine  
Tranycypromine  
Isocarboxazid

**Heterocyclic derivatives**

Clomipramine  
Ainoxapine  
Maproliline

**SSRIs**

Fluoxetine  
Paroxetine  
Seitaline

**Serotonin and noradrenergic reuptake inhibitors (SNRIs)**

Nefazodone  
Venlafaxine

**Derivatives of other chemical classes**

Bupropion  
Trazodone

**Table 4.** Clinical considerations for heterocyclic antidepressant drugs.<sup>3</sup>

Common side effects	Dry mouth; nausea and vomiting; constipation; urinary retention; postural hypotension; nervousness; insomnia; drowsiness; reflux; anorgasmia (women); erectile problems, loss of libido, gynecomastia (men)
Serious side effects	Mania, seizures, obstructive jaundice, leukopenia, tachycardia, arrhythmias, myocardial infarction, stroke

**Table 5.** Drug interactions for heterocyclic antidepressant drugs.<sup>3</sup>

Barbiturates	CNS depression
Benzodiazepines	CNS depression
Anticonvulsants	Interferes with the action of anticonvulsants
Antihistamines	CNS depression
Warfarin	Inhibits warfarin metabolism (can increase International Normalized Ratio (INR))
Cimetidine	Inhibits clearance; can lead to toxicity of antidepressant
Erythromycin	Interfers with the action of the antibiotic
Epinephrine	Actions are enhanced; use with caution

**Table 6.** Clinical considerations for SSRIs.<sup>3</sup>

Common side effects	Dry mouth, nausea and vomiting, diarrhea, anorexia, weight loss, blurred vision, insomnia, nervousness, sexual dysfunction, sweating, sedation, akathisia
Serious side effects	Mania, seizures, hypotension, anemia, bleeding (platelet effect), hypothyroidism

**Table 7.** Drug interactions involving SSRIs.<sup>3</sup>

Benzodiazepines	CNS depression
Beta blockers	Bradycardia
Warfarin	Inhibits warfarin metabolism (can increase INR)
Cimetidine	Inhibits clearance; may lead to toxicity of SSRI

be administered with caution and in decreased dosages for patients who are taking a benzodiazepine for an anxiety disorder. The dentist may prescribe a benzodiazepine as a sedative to control dental-related anxiety but individuals receiving psychotropic agents for a psychiatric disorder must be treated with care. Medication dosage usually can be reduced to avoid overdepression of the CNS. The dentist should consult with the patient's physician before administering these drug combinations. The patient can be monitored during treatment by utilizing a pulseoximeter.<sup>27,30-32</sup>

Antidepressant drugs used to treat anxiety states (see Table 3) can result in important side effects and potentially significant drug interactions with agents used in dentistry. Tables 4–7 present side effects and drug interactions of heterocyclic antidepressants and SSRIs. Epinephrine must be used with caution in

patients taking heterocyclic antidepressant drugs to avoid a hypertensive episode. While it is safe to use small amounts (1:100,000) in local anesthetics, stronger concentrations of epinephrine must be avoided.<sup>3</sup>

Antipsychotic medications may be used to treat certain patients with anxiety (see Table 8). The significant side effects and drug interactions of these medications are listed in Table 9. These drugs should be administered in reduced dosages. Epinephrine must be used with care when given to patients taking an-

tipsychotic medications, as severe hypotension can result, compared to hypertension resulting from the heterocyclic antidepressants.

**Conclusion**

Anxiety is found in many dental patients. The degree of anxiety is low for most patients. Dentists can manage such patients in the dental environment by showing a personal interest in them, displaying concern for their feelings, and allowing them to ask questions regarding their dental treatment. The

dentist should answer all questions in a direct and honest manner. Verbal and nonverbal communication must be consistent.

Hypnosis, oral/parenteral sedation agents, or nitrous oxide and oxygen can be used for patients who remain anxious during dental treatment. Patients should be referred to their physician if they display severe adverse drug reactions to agents used for treating anxiety disorders. The dentist must avoid drug interactions by reducing the dosage of certain sedative agents for patients being treated with benzodiazepines.

Patients being treated with antidepressant drugs are more sensitive to the effects of epinephrine, which must be used with caution to avoid a hypertensive episode; hypotension may result when patients being treated with antipsychotic medications receive epinephrine. In both of these cases 1:100,000 epinephrine can be used in the local anesthetic if no more than two or three cartridges are used.

### Author information

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**Table 8.** Commonly used antipsychotic medications.<sup>3</sup>

<b>Phenothiazines</b>	<b>Butyrophenones</b>	<b>Oxoidoles</b>
<i>Aliphatics</i>	Haloperidol	Molindone
Chlorpromazine		
<b>Piperazines</b>	Thioxanthenes	Dibenzoxazepines
Fluphenazine	Chlorprothixene	Loxapine
Perphenazine	Thiothixene	
Trifluoperazine		
<b>Piperidines</b>		
Thioridazine		

**Table 9.** Side effects and drug interactions of antipsychotic drugs.<sup>3</sup>

<b>Significant side effects</b>	<b>Significant drug interactions</b>
Agranulocytosis	<i>Prolong and intensify effects of the following drugs, which may result in severe respiratory depression</i>
Visual impairment	Sedatives
Cholestatic jaundice	Hypnotics
Excessive or abnormal involuntary movements	Opioids
Dystonia, akathisia	Antihistamines
Parkinson-like symptoms	<i>Produce hypotensive crisis (epinephrine)</i>
Dyskinesia, tardive dyskinesia	No more than two cartridges of 2.0% lidocaine with 1:100,000 epinephrine
Xerostomia	Avoid more concentrated forms of epinephrine
Hypotension—Orthostatic hypotension	
Tachycardia	
Seizures	
Neuroleptic malignant syndrome	

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# DART

## Dental Article Review and Testing

Exercise No. 131  
Subject Code: 750  
Special Patient Care

The 15 questions for this exercise are based on the article, "Anxiety disorders: Dental implications," on pages 562–568. This exercise was developed by Leslie A. Hayes, DDS, FAGD, in association with the *General Dentistry* DART Committee.

### Reading the article and successfully completing this exercise will enable you to:

- recognize signs of anxiety in patients;
- understand the various components of anxiety disorders;
- review the side effects and drug interactions of medications used to treat anxiety disorders; and
- learn dental management skills for use before, during, and after the appointments with anxious patients.

Answers for this exercise must be received by December 31, 2004.

Select the most correct answer to each question. You must answer at least 12 of the 15 questions correctly (80%) to receive credit.

Be sure to keep a copy of this exercise for your records.

To register by phone, call toll-free 888/AGD-DENT (888/243-3368), ext. 5300.

1. Anxiety can be a purely psychological or purely physical experience. Which of the following symptoms is a physical manifestation of anxiety?
  - A. Tachycardia
  - B. Agoraphobia
  - C. Post-traumatic stress disorder (PTSD)
  - D. Panic disorder
2. What psychiatric problem is found most frequently in the general population?
  - A. Bipolar disorder
  - B. Anxiety disorders
  - C. Schizophrenia
  - D. Depression
3. A phobia is an irrational fear that interferes with normal behavior. A panic attack is a sudden, unexpected, overwhelming feeling of terror which peaks in approximately 10 minutes and usually lasts for 50–60 minutes.
  - A. Both statements are true.
  - B. The first is true; the second is false.
  - C. The first is false; the second is true.
  - D. Both statements are false.
4. What is the approximate prevalence of panic disorder in cardiac patients?
  - A. 2.5%
  - B. 5.0%
  - C. 7.0%
  - D. 9.0%
5. What percentage of a community is likely to experience an anxiety disorder?
  - A. 1.0–3.5
  - B. 3.0–6.0
  - C. 2.5–5.0
  - D. 4.0–7.0
6. Panic disorders, phobic disorders, and obsessive compulsive disorders occur more frequently among first-degree relatives of people with these disorders than among the general population. If one first-degree relative has a panic disorder, other relatives have approximately a 25% chance of developing a panic disorder.
  - A. Both statements are true.
  - B. The first is true; the second is false.
  - C. The first is false; the second is true.
  - D. Both statements are false.
7. Approximately what percentage of cardiac patients see a doctor because of symptoms associated with panic disorder?
  - A. 10
  - B. 15
  - C. 20
  - D. 25
8. Patients with a history of panic attacks have been reported to have an increased incidence of
  - A. reflex sympathetic dystrophy.
  - B. chronic obstructive pulmonary disease.
  - C. mitral valve prolapse.
  - D. coronary artery disease.
9. Which symptoms are considered the cardinal features of PTSD?
  1. Hyperarousal
  2. Intrusive symptoms or flashbacks
  3. Agoraphobia
  4. Psychic numbing
    - A. 1, 2, and 3 only
    - B. 1, 2, and 4 only
    - C. 1, 3, and 4 only
    - D. 2, 3, and 4 only
10. Which three modalities are used most commonly to treat anxiety disorders?
  1. Pharmacologic
  2. Behavioral
  3. Physiologic
  4. Psychologic
    - A. 1, 2, and 3 only
    - B. 2, 3, and 4 only
    - C. 1, 2, and 4 only
    - D. 1, 3, and 4 only
11. What is the only drug approved by the FDA for treating PTSD?
  - A. Sertraline hydrochloride
  - B. Paroxetine hydrochloride
  - C. Fluoxetine
  - D. Nefazodone hydrochloride
12. In which case is diazepam contraindicated?
  - A. Moderate-to-heavy smokers
  - B. Patients taking clindamycin
  - C. Children
  - D. Driving or operating machinery
13. Which statement is true regarding tricyclic antidepressants?
  - A. They interact negatively with cimetidine and erythromycin.
  - B. They exhibit a slow rate of onset.
  - C. They initially exacerbate anxiety symptoms.
  - D. They are superior to benzodiazepines in treating panic disorder and agoraphobia.
14. Management of the anxious patient could include all but which of the following modalities?
  - A. Hypnosis
  - B. Oral or parenteral sedation
  - C. Avoiding direct eye contact with the patient
  - D. Confronting the patient about appearing anxious
15. Important side effects of antipsychotic drugs include all but which of the following?
  - A. Tardive dyskinesia
  - B. Hypertension
  - C. Agranulocytosis
  - D. Neuroleptic malignant syndrome