Exposure Therapy for Anxiety Disorders


Exposure-based therapies are highly effective for patients with anxiety disorders, to the extent that exposure should be considered a first-line, evidence-based treatment for such patients. In clinical practice, however, these treatments are underutilized, which highlights the need for additional dissemination and training.

Over a quarter of the people in the US population will have an anxiety disorder sometime during their lifetime.¹ It is well established that exposure-based behavior therapies are effective treatments for these disorders; unfortunately, only a small percentage of patients are treated with exposure therapy.²,³ For example, in the Harvard/Brown Anxiety Research Project, only 23% of treated patients reported receiving even occasional imaginal exposure and only 19% had received even occasional in vivo exposure.⁴ In part, this may be a lack of well-trained professionals, because most mental health clinicians do not receive specialized training in exposure-based therapies.⁵,⁶ Another factor may be that many health care professionals do not understand the principles of exposure or may even hold (usually unfounded) negative beliefs about this form of treatment. Surveys of psychologists who treat patients with PTSD show that the majority do not use exposure therapy and most believe that exposure therapy is likely to exacerbate symptoms.⁷,⁸ However, individuals with trauma histories and PTSD express a preference for exposure therapy over other treatments.⁹ Furthermore, exposure therapy does not appear to lead to symptom exacerbation or treatment discontinuation.¹⁰ Indeed, a wealth of evidence indicates that exposure-based therapy is associated with improved symptomatic and functional outcomes for patients with PTSD.¹¹ The available research literature suggests that exposure-based therapy should be considered the first-line treatment for a variety of anxiety disorders. Here we review a handful of the most influential studies that demonstrate the efficacy of exposure therapy. We also discuss theoretical mechanisms, practical applications, and empirical support for this treatment and provide practical guidelines for clinicians who wish to use exposure therapy and empirical evidence to guide their decision making. Exposure therapy is defined as any treatment that encourages the systematic confrontation of feared stimuli, which can be external (eg, feared objects, activities, situations) or internal (eg, feared thoughts, physical sensations). The aim of exposure therapy is to reduce the person's fearful reaction to the stimulus.
Graded exposure vs flooding

Most exposure therapists use a graded approach in which mildly feared stimuli are targeted first, followed by more strongly feared stimuli. This approach involves constructing an exposure hierarchy in which feared stimuli are ranked according to their anticipated fear reaction (Table 1). Traditionally, higher-level exposures are not attempted until the patient’s fear subsides for the lower-level exposure. By contrast, some therapists have used flooding, in which the most difficult stimuli are addressed from the beginning of treatment (an older variant, implosive therapy, is not discussed in this article). In clinical practice, these approaches appear equally effective; however, most patients and clinicians choose a graded approach because of the personal comfort level.12,13

In vivo vs imaginal

In vivo exposure refers to real-world confrontation of feared stimuli. Sometimes, in vivo exposure is not feasible (eg, it would be both difficult and hazardous for someone with combat-related PTSD to experience the sights, sounds, and smells of combat in real life). In such cases, imaginal exposure can be a useful alternative. In imaginal exposure, the patient is asked to vividly imagine and describe the feared stimulus (in this case, a traumatic memory), usually using present-tense language and including details about external (eg, sights, sounds, smells) and internal (eg, thoughts, emotions) cues.

In recent years, virtual reality exposure therapy (patients are immersed in a virtual world that allows them to confront their fears) has been examined as an alternative means of imaginal exposure, and preliminary data suggest that it can be quite effective.14,15 Imaginal exposures can also be useful for confronting fears of worst-case scenarios (eg, patients with obsessive-compulsive disorder [OCD] who imagine that they might contract a deadly illness, patients with social phobia who imagine that they are being ridiculed) to reduce the aversiveness of the thought.

What is already known about exposure therapy for anxiety disorder?

Exposure therapy is defined as any treatment that encourages the systematic confrontation of feared stimuli, with the aim of reducing a fearful reaction. Over a quarter of the people in the US population will have an anxiety disorder sometime during their lifetime, and available research literature suggests that exposure-based therapies should be considered the first-line treatment for these disorders. Although it is well established that exposure-based therapies are effective treatments for these disorders, however, only a small percentage of patients are actually treated with this approach.

What new information does this article provide?

We review the results of a handful of the most influential studies that demonstrate the efficacy of exposure therapy and disseminate information about the theoretical mechanisms, practical applications, and empirical support for this treatment. In addition, we provide practical guidelines for
clinicians who wish to use exposure-based therapies and empirical evidence to guide their decision making.

What are the implications for psychiatric practice?

In clinical practice, exposure-based therapies for anxiety disorders are underutilized, which highlights the need for additional dissemination and training. We hope the dissemination of the theoretical mechanisms, practical applications, and empirical support for exposure-based therapies in this article will encourage mental health practitioners to embrace this modality as a viable and easily accessible option in the treatment of anxiety disorders.

**Internal vs external**

Exposures can target internal and/or external cues. Exposures to external cues include a spider-phobic patient handling a spider, or a height-phobic patient systematically approaching increasing heights in a skyscraper. Using exposure to internal cues, a patient with panic disorder can run in place to experience physiological sensations (e.g., heart palpitations) that elicit anxious reactions, a patient with generalized anxiety disorder (GAD) can purposefully induce worry thoughts, a patient with PTSD can revisit traumatic memories, and a patient with OCD can intentionally evoke intrusive and aversive thoughts.

**With or without relaxation**

One of the earliest variations of exposure therapy was systematic desensitization, in which patients engage in imaginal exposure to feared stimuli while simultaneously undergoing progressive muscle relaxation. Subsequent dismantling studies have shown that exposure, rather than relaxation, is the active ingredient and that relaxation does not improve outcomes. The addition of relaxation exercises has been counterproductive in some patients, such as those with panic disorder. Because of the apparent importance of interoceptive exposure (i.e., learning to tolerate uncomfortable physical sensations), relaxation exercises aimed at decreasing these sensations may actually attenuate the outcome of therapy, in much the same way as does the use of as-needed short-acting benzodiazepines.

**Efficacy of exposure therapy**

Several studies have demonstrated the efficacy of exposure-based therapies for anxiety disorders, a finding that is summarized in several published meta-analyses. examined the effects of single-session in vivo exposure (that lasts 1 to 3 hours) for patients with specific phobias. At posttreatment follow-up (after an average of 4 years), 90% of these patients still had significant reduction in fear, avoidance, and overall level of impairment and 65% no longer had a specific phobia.

Barlow and colleagues investigated the effects of interoceptive exposure with components of cognitive restructuring (cognitive-behavioral therapy [CBT]), imipramine, and a combination of the two in patients with panic disorder. At first, all treatments appeared equally efficacious; however, at 6 months’ follow-up, 32% of patients in the CBT group continued to maintain their treatment gains compared with 20% in the imipramine group and 24% in the combined-treatment group. Foa and colleagues randomized patients with OCD to receive in vivo exposure and response prevention, clomipramine, or a combination of both. For patients who completed the study, 86% in the exposure group improved on a measure that examined the frequency and severity of obsessions and compulsions compared with 48% in the clomipramine group and 79% in the combined-treatment group.

Several others have also demonstrated the efficacy of exposure-based treatments or treatment components for patients with GAD, social anxiety disorder, and PTSD.

**Theoretical mechanisms of exposure therapy**

Biologically, the extinction of fear appears to be mediated by N-methyl-d-aspartate receptor activity.
in the basolateral amygdala, a finding that has led to the use of neuroplasticity compounds such as d-cycloserine to augment exposure. 28,29 There are 4 major theories that attempt to explain the psychological mechanisms of exposure therapy: habituation, extinction, emotional processing, and self-efficacy (Table 2).

**Habituation** theory purports that after repeated presentations of a stimulus, the response to that stimulus will decrease. 30 For example, initial exposure to ocean water can be cold. However, over time and with repeated exposures, the water feels less cold as the person acclimates. Similarly, when repeatedly facing a fear-provoking stimulus in exposure therapy, the patient experiences habituation, or a natural reduction in fear response. While many clinicians aim for habituation to occur within the session, researchers have found that optimal treatment effects occur during the period of learning consolidation between sessions. 31,32

**Extinction** theory emerges from a classic conditioning model in which the unconditioned stimulus is a situation, place, or person that initially caused fear (the unconditioned response)—for example, a dog bite. Through the process of stimulus generalization, fear reactions become learned (conditioned response) and are elicited by other stimuli, such as dogs that are not dangerous (conditioned stimuli). Because of the aversiveness of the conditioned response, fearful individuals are motivated to avoid the conditioned stimuli, thus reinforcing avoidance behavior as well as the belief that relief from fear only comes from avoidance. 33

Exposure therapy is thought to weaken the conditioned response through repeated exposure to the conditioned stimuli in the absence of the unconditioned stimulus. For example, exposure to dogs (conditioned stimuli) without being bitten (absence of unconditioned stimulus) weakens the relationship between the conditioned stimuli and the fear of conditioned response. One limitation of extinction theory is that most phobic patients do not identify an initial conditioning event. 34

**Emotional processing** theory suggests that fear is stored in memory as a network of stimuli (eg, social gathering), response (eg, sweaty palms), and meaning (eg, “I’m not good at socializing, I’m a failure”) components. 35 Fearful individuals are thought to ascribe faulty meanings to stimuli in a way that increases fear toward those stimuli. Exposure to fear-provoking stimuli is thought to result in a new way of processing information and to correct the faulty fear structure. 36,37 For example, in patients with social anxiety disorder, social interactions can be perceived as rewarding, even if the patients have sweaty palms and feel some anxiety.

The **self-efficacy** theory focuses more on increasing skills and mastery over a situation or performance than on reducing a fear response directly. 38 Persons with anxiety disorders tend to underestimate their capabilities to cope with fear. Therefore, persons able to face their fear and successfully tolerate it without avoiding it or withdrawing from it begin to realize they are more capable and resilient than they had imagined. Thus, they become more willing to face their fears in different contexts, thereby generalizing treatment effects.

These theoretical mechanisms of exposure are not mutually exclusive, and all might be correct for any given patient. With repeated exposures, patients experience reduced sensations of fear (habituation), learn a new set of associations (extinction), feel increasingly able to cope with fear (self-efficacy), and generate new interpretations of the meanings of previously feared stimuli (emotional processing).
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Treatment guidelines for clinicians who use exposure therapy are shown in Table 3. The first step in successful exposure therapy is the development of an exposure hierarchy. The patient and clinician brainstorm as many feared external and internal stimuli as possible and then rate them in order of difficulty. The most common ranking method is the Subjective Units of Discomfort (SUD) scale, which assigns a 0 to 100 numeric value to each item.39 (This scale can be found online in Wikipedia and at http://www.newworldencyclopedia.org/entry/Joseph-Wolpe.)

The next step is to conduct exposures in a gradual and systematic manner. Repeated use of the SUD scale will help track the patient’s fear level as it increases and decreases. Typically, a higher item is not attempted until the patient’s SUD level decreases significantly for a lower-ranked item. During exposure therapy, safety behaviors should be eliminated to the extent possible. Safety behaviors refer to all unnecessary actions the patient takes to feel better or to prevent feared catastrophes. Left unchecked, safety behaviors can undermine the process of exposure therapy by teaching the patient a rule of conditional safety (eg, “The only way to be safe during a panic attack is to have my medication with me”) rather than a rule of unconditional safety (eg, “Panic attacks will not harm me, regardless of whether I am carrying my medications”).

Cognitive restructuring may also be used as an adjunct to exposure therapy. Cognitive restructuring refers to identifying and challenging irrational, unrealistic, or maladaptive beliefs. In patients with anxiety disorders,2 of the more common faulty thinking patterns (ie, cognitive distortions) are probability overestimation and catastrophizing. Probability overestimation refers to the overprediction of unlikely outcomes, such as the belief that a commercial flight is highly likely to crash. Catastrophizing refers to the magnification of the consequences of aversive outcomes, such as the belief that making a mistake during a speech will lead to a lifetime of ridicule and ostracism. During the process of exposure exercises, the therapist helps the patient identify these cognitive distortions; examine the evidence for and against the beliefs; and rehearse new, more realistic ways of thinking.

**Conclusion**

Exposure-based therapies are highly effective for patients with anxiety disorders, to the extent that exposure should be considered a first-line, evidence-based treatment for such patients. In clinical practice, however, these treatments are underutilized, which highlights the need for additional dissemination and training. We hope this information will encourage clinicians to embrace exposure-based therapies for anxiety disorders as a viable and easily accessible treatment option.

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