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CHAPTER 3

An Introduction to Stress Management and Crisis Intervention

LISA LÓPEZ LEVERS

CHAPTER OVERVIEW

This chapter focuses on introducing the reader to theories about stress and crisis and on promoting basic stress management and crisis intervention skills. Stress and crisis often intersect with trauma and disaster events and are foundational aspects of the scaffold being created, in the first four chapters of this book, for grasping the profound effects that stress, crisis, disaster, and trauma can have at individual and systemic levels.

LEARNING OBJECTIVES

After reading this chapter, the reader should be able to:

1. Understand the impact of stress;
2. Develop strategies for helping clients to manage stress;
3. Understand the nature of crisis;
4. Define crisis situations;
5. Identify relevant crisis intervention for individuals and communities; and,
6. Develop awareness of how to apply stress management and crisis intervention strategies.

INTRODUCTION

Stress is a regular part of life; people encounter numerous stressors in everyday living. Sometimes stress motivates us to accomplish routine work, but at other times, stress may hinder our ability to be productive. When stress becomes overwhelming for an individual, the person may seek counseling. Similarly, it is not unusual for clients to experience one or more crises, well within the norms of quotidian living. However, when a crisis situation continues to loom, and perhaps becomes intense enough to affect functioning, then the affected person

may be prompted to seek counseling. It also is possible for clients to experience crises while they already are in counseling for other reasons. All people experience both minor and major types of stressors and crises across the life-span, so in this sense, stress and crisis are a part of existence; however, when stress or crisis pushes people to the tipping point, then engaging in effective counseling can become imperative. Stress management and crisis intervention are essential skill sets for all mental health and behavioral health professionals and paraprofessionals.

Everyone working in the mental health field can expect to identify, assess, and mediate client stress as well as crisis. Not all stress leads to a crisis or a trauma event. Not every crisis escalates into a traumatizing experience; however, most traumatic events involve some element of crisis and a lot of stress. Not every crisis is a part of a larger disaster, but disaster situations usually include multiple crises and stressors. Stress is an aspect of crisis, trauma, and disaster. For these reasons, it is important for trauma-informed clinicians to be adept at helping their clients to maneuver through and to manage stressors and crises. In other words, professional counselors need to acquire crisis intervention and stress management strategies as a basic component of being a competent clinician; dealing with stress and crisis are foundational components of the scaffold that we are constructing and examining in Chapters 1, 2, 3, and 4 of this textbook.

It is essential that mental health professionals be able to differentiate among the constructs associated with stress, crisis, trauma, and disaster (Yeager & Roberts, 2015). At the same time, it is important to understand the often-complex interrelationships among these dynamics, how they can affect people, and how stress and crisis may be starting points for a longer clinical process. In this chapter, we look at Understanding the Nature of Stress, Understanding the Nature of Crisis, and Counseling Implications, as well as identifying some of the more relevant stress management and crisis intervention strategies, by way of learning how to apply these constructs. After presenting these discussions, we conclude with a brief summary of the chapter. Practice-based resources are available through access to the Springer platform; details for gaining access are noted at the end of the chapter.

UNDERSTANDING THE NATURE OF STRESS

Stress is actually the body's reaction to any situation that feels threatening. This chemical response occurs whether harm or danger is real or imagined, and whether the threat or potential threat exists in the environment or is based on a person's internal perception. As discussed in Chapters 2 and 4 of this textbook, extreme stress engages the fight-or-flight response, as a means of protection. When this happens, the autonomic nervous system (ANS) activates, and the body releases stress hormones, which then produce physiological responses such as increased heart rate, rapid breathing, and tensing of muscles.

In the now classic book, *The Stress of Life*, Selye (1956/1978) was the first to talk extensively about the impact of stress on humans, both biologically and emotionally. As previously mentioned, stress is a hormonally driven, and therefore autonomic, physiological state that occurs in response to situations that demand change. This state is not necessarily always negative; Selye also coined the term "eustress," which implies the kind of "good" stress that can motivate an individual. An example of eustress would be jumping out of bed when the alarm goes off in the morning—we care enough about our work obligations, thus having the right level of eustress, to motivate us to get moving so that we can arrive at work on time. However, when people talk about being "stressed out," the connotation usually relates to a negative state of tension or agitation. Even this kind of pressure is not necessarily a "bad" thing, as under precipitating circumstances stress activates a primitive part of the brain to initiate the fight-or-flight response; stress is like the body's instant messaging system for protecting us from danger. It is when danger has passed and we are unable to "turn off" the stress response that the effects of prolonged stress can begin to take a toll on our bodies, including on important regulating systems like the endocrine and immune systems. Alternatively, sometimes when we are under extreme stress, instead of defaulting to the fight-or-flight response, our bodies instead go into a kind of freeze response, like a deer caught in

headlights; this type of inertia may replace the fight-or-flight response or even heighten the original perception of danger.

In a discussion about the symptoms of stress, a *WebMD* article has identified a number of emotional, physical, cognitive, and behavioral symptoms that may be associated with stress overload. (The lists of symptoms can be viewed, categorically, at the *WebMD* site, noted in the reference section [Casarella, 2019].) When we think about stress overload, we need to consider the neurobiological effects of stress, as discussed in Chapters 1 and 2. Prolonged and unattended stress can cause serious physiological problems and may even lead to poor health. As mentioned earlier in the chapter, stress is a part of life, and our bodies equip us with mechanisms for dealing with the ordinary stress of daily living. However, when stress continues unabated or is compounded by additional or more severe stressors, our bodies begin to feel the consequences; our internal alarm system, the fight-or-flight response, remains engaged (Mayo Clinic, 2019). Long-term stress or chronic stress can cause serious health concerns and also may make existing health problems worse. This includes a number of mental health and behavioral health problems, high blood pressure, cardiovascular disease, addiction, and gastrointestinal problems, among others (Casarella, 2019; Harvard Medical School, 2020). The American Psychological Association (2020b) has qualified increasing levels of stress in the United States as being of crisis proportions, and we certainly have seen the entire range of stress responses, from mild to severe, during the COVID-19 pandemic.

In its annual survey on stress in America, the American Psychological Association (APA, 2020b, p. 1) has disclosed that Americans are "profoundly affected by the COVID-19 pandemic, and that the external factors Americans have listed in previous years as significant sources of stress remain present and problematic. These compounding stressors are having real consequences on our minds and bodies." The Centers for Disease Control and Prevention (CDC, 2021) also has emphasized the extent to which the COVID-19 pandemic has had a major impact on our lives. The CDC has identified the following ways in which stress can manifest:

- Feelings of fear, anger, sadness, worry, numbness, or frustration
- Changes in appetite, energy, desires, and interests
- Difficulty concentrating and making decisions
- Difficulty sleeping or nightmares
- Physical reactions, such as headaches, body pains, stomach problems, and skin rashes
- Worsening of chronic health problems
- Worsening of mental health conditions
- Increased use of tobacco, alcohol, and other substances (CDC, 2021, "Coping With Stress," para. 2)

Brief discussions of real and perceived threat, toxic stress, and stress management strategies are in order here.

Real and Perceived Threat

A stress response typically is triggered by something in the environment, for example, unusually heavy traffic on the way to work or a spat with a significant other. In other words, an existing threat in the environment may precipitate an acute stress response. These types of threats usually are resolved in fairly short order, and life goes on. Sometimes people become distressed by what they perceive as a *potential* threat in the environment. The person who encountered heavy traffic on the way to work ends up being a little late, and as the person is moving from the parked vehicle to the office entrance, they become distressed that the tardiness might anger the boss, who could even fire the person. So, the person enters the building in a state of stress and is fearful even to encounter the boss. In reality, the boss also was delayed by the same traffic and arrives a little after the employee, who is already seated at their desk, and can see the boss just arriving. The employee is flooded with a sense of relief. The danger was not real, but the perceived threat still caused a stress reaction, with

stress hormones that had been pumping throughout the body, only moments prior, beginning to subside upon the person's sense of relief. The body winds down and returns to homeostasis.

Acute or short-term stress is a part of life that people generally manage on their own. However, when acute stress becomes chronic or longer-term stress, the individual may need to seek mental health or behavioral health assistance. An example of chronic stress might involve that person, mentioned previously, who had a minor spat with a significant other; we can imagine that if the spat becomes ongoing and increasingly more intensive arguing, the relationship might move from one that is vulnerable to one that is compromised. This kind of chronic stress is an indicator that professional help may be needed; unmitigated chronic stress can lead to toxic stress and may result in health problems.

Toxic Stress

Numerous and compounding adverse experiences can lead to excessive activation of the stress response system; this, in turn, can cause wear and tear on the body and on the brain, resulting in toxic stress (Harvard Medical School, 2021). It is important to understand that it is not much an event that is toxic, it is the continual engagement of the sympathetic nervous system and the ongoing biochemical responses that can become toxic to the body and interfere with maintaining good health (Franke, 2014). An essential feature of toxic stress is that the body does not have an opportunity to return to a state of balance or homeostasis; the body is not able to recover fully between onslaughts of neurobiological response to ongoing stress. The COVID-19 pandemic may have provided the "perfect storm" for examples of toxic stress. We know that during the pandemic, instances of substance abuse, intimate partner violence, child abuse, and suicide have increased (Melillo, 2021). We might infer that as people were forced to accommodate to the demands of the pandemic, often under the pressure of multiple stressors and increased isolation, and to adjust to many new norms, high levels of stress became toxic for some.

Stress Management

Whether clients report mild or more intense stress responses, it is important that mental health professionals attend to such complaints and assist clients in learning how to manage stressors in their lives. This may have serious implications for other mental health concerns that a client may present as well as for existing and potential health problems. There is no one-size-fits-all prescription for stress management techniques; it really depends on the particular client, their lifestyle, and their personal preferences. The Mayo Clinic offers some suggestions in one of their publications, and these appear in Box 3.1.

BOX 3.1

Information From the Field: Stress Management Strategies

Stress management strategies include:

- Eating a healthy diet and getting regular exercise and plenty of sleep
- Practicing relaxation techniques such as trying yoga, practicing deep breathing, getting a massage, or learning to meditate
- Taking time for hobbies, such as reading a book or listening to music
- Fostering healthy friendships
- Having a sense of humor
- Volunteering in your community
- Seeking professional counseling when needed

(From Mayo Clinic. (2019, March 19). Stress management. https://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/stress/art-20046037)

Helping clients to identify the stressors in their lives and to understand the physiological responses to those stressors can assist in allaying further stress. Working with clients to use the stress management strategies that fit their particular lifestyles can go a long way in cultivating a calmer approach to life and perhaps even a healthier way of living.

UNDERSTANDING THE NATURE OF CRISIS

In the same way that stress is a reality of existence, crisis also is a part of life; we all experience stress and crisis in our lives. However, crisis is an interesting construct, particularly from the perspective of its paradoxical nature, that is, from the viewpoint that it can have positive or negative outcomes. I begin this discussion with popular and clinical connotations and definitions of the word "crisis." In a comment about semantic drift, the Merriam-Webster (2021) describes how the original definition of "crisis" shifted from one based on a pivoting point in an illness, whether getting better or worse, to a more contemporary definition regarding any situation which needs to be addressed. The word "crisis," in its most popular sense, has come to infer some type of instability or even danger. In the American Psychological Association's (2020a), *Dictionary of Psychology*, crisis is defined, in the earlier connotation of the word, as "a turning point for better or worse in the course of an illness," and the later, more clinical connotation as "a situation (e.g., a traumatic change) that produces significant cognitive or emotional stress in those involved in it" ("crisis," para. 1–2). A World Health Organization (WHO, 2012) definition of crisis focuses on its unpredictability and the potential for harm, especially when communities are unprepared. Such popularized and clinical understandings of the word's meaning help to emphasize the potentially paradoxical nature of experiencing crisis and to offer a basis by which a helper potentially can assist a client in addressing, managing, and transforming a crisis into a moment of or an opportunity for growth. In the helping professions, we tend to view a crisis as a troubling but pivotal moment, requiring some type of a change, which often then promotes development and growth, even in the face of adversity, potentially facilitating the person's improved situation. Of course, we need a much broader knowledge base, in order to glean a professional understanding of what constitutes a crisis and what it means to intervene and manage a crisis.

Counselors and other helpers need to possess basic crisis intervention skills, in order to work with clients in crisis, clients experiencing trauma, and survivors of disaster situations. Clearly, helping our clients to manage and contain their crises constitutes a pertinent clinical skill and contributes to building the trauma scaffold that we discussed earlier. Purvis (1994) offers the following useful definition:

> Crisis Management is the careful and tactful management of a situation in which there is trouble or danger that has the possibility of serious and negative consequences. The possible serious and negative consequences might include litigation, injury to individuals and/or property, death of an individual, disruption of the normal routine, and loss of confidence and trust in an individual or an institution. (p. 23)

Purvis further notes that the consequences of a crisis can be real or imagined, and that this depends on the mindset of the person or persons involved, directly and indirectly. It is important for responders to be aware of this and to "respond in a professional, legal, humane, and ethical manner" (Purvis, 1994, p. 23).

James and Gilliland (2017) point to the numerous definitions of crisis, spanning the decades in which we formally have been providing crisis intervention services. A full history of the crisis intervention movement is beyond the scope of this chapter, but crisis intervention strategies primarily emerged in the 1960s and 1970s, most notably within the context of addressing growing drug and alcohol problems, women's concerns during the second wave of the women's movement, and Vietnam veterans returning from combat (James & Gilliland, 2017). Additionally, we see that crisis intervention practices were popularized by the use of Norman Kagan's *Interpersonal Process Recall* (IPR), employed in professional and

paraprofessional trainings by crisis hotlines, emerging substance abuse centers, and university programs (Kagan, 1980).

Given the history of training professionals and paraprofessionals in the use of crisis intervention techniques, and how definitions have evolved, in conjunction with the changing needs of society, it is difficult to arrive at a singular and exclusively definitive understanding of crisis. Ultimately, however, James and Gilliland (2017) have offered a succinct and contemporary definition of crisis as the "perception of an event or situation as an intolerable difficulty that exceeds the person's current resources and coping mechanisms" (p. 9). They further have asserted that until a crisis situation is mitigated or resolved, an individual may become increasingly more distraught on multiple levels. These are useful conceptualizations for mental health professionals, especially in their emphasis upon an individual client's own *perceptions* of danger and upon an individual client's *ability to cope* in the moment or in the situation. When a client is in crisis, it is not the time for a clinician to be judgmental about whether the person's experience matches a textbook definition of crisis. If someone tells me that they are in crisis, I am going to take the person at their word, and I am going to assess for that individual's unique capacity to cope, in the here and now. When someone is in crisis mode, we move one step at a time, and at the client's own pace. The Substance Abuse and Mental Health Services Administration (SAMHSA) (2020a, p. 9) sums up crisis work brilliantly: "Perhaps the most potent element of all, in an effective crisis service system, is relationships. To be human. To be compassionate. We know from experience that immediate access to help, hope and healing saves lives." Box 3.2 offers a clinical vignette that illustrates a human crisis and a crisis response.

BOX 3.2

Clinical Vignette: Monique's Crisis

Monique is a 34-year-old, African American mother of two, an 8-year-old daughter and an 11-year-old son. She was diagnosed with breast cancer in late 2019 and began chemotherapy in early 2020. Monique was working as a waitress at the time of her diagnosis, but had to quit her job, both due to the COVID-19 pandemic and to receive treatment. Like so many positions in the food industry, Monique's job did not afford any healthcare benefits, so she had to apply for assistance from a variety of social safety nets, in order to take care of her children as well as her healthcare needs. Not too long after beginning chemotherapy, the public health effects of the COVID-19 pandemic began to take effect. The children had to stay home from school, needing computers for online distance learning, which they were able to obtain from the school. Monique was fearful about leaving her home, due to her compromised immune system. At the beginning of the pandemic, Monique's brother, her only remaining family member, was helping her, especially by bringing groceries to the home for her and the children. But eventually, her brother, a taxi driver, contracted COVID-19, was hospitalized, and died. Monique was frantic. She was facing so much grief as well as an abundance of stressors, many associated with living in poverty, the systemic effects of racism, and dealing with her illness; in addition, she needed to ensure that she could feed her children. When Monique was first prepped for chemotherapy, she was given the name and contact information for a clinical mental health counselor, in case she needed emotional support related to her cancer and chemotherapy. She did not use the information at the time, as she was raised to believe that "needing" counseling is a sign of weakness. But when she found herself in this crisis situation, feeling so desperate, she contacted the counselor, Gwen.

Gwen immediately arranged to see Monique via telehealth. They scheduled an appointment for after school time, so that Monique was able to use one of the laptops that the school had given the children for online classes. Although Monique had many pressing psychosocial issues that needed to be addressed, Gwen initially assessed the critical nature of Monique's main crisis concern and ascertained that getting food to the family was a necessary step in beginning to address the crisis. In fact, during that first session, Gwen asked Monique to remain online for several minutes, while she made a call on Monique's behalf. Gwen called a food bank with which she had a good networking relationship. They

behalf. Gwen called a food bank with which she had a good networking relationship. They could deliver a food box that day, if authorized. Gwen came back to Monique, obtained the necessary permission, and placed the request for delivery of free food, beginning that day and then weekly thereafter. Monique was tearful, grateful, and a little shaken that things were moving so quickly. Gwen and Monique discussed the food crisis and how good it was that Monique had reached out to Gwen; Gwen also used the opportunity to help Monique begin to calm down a bit. By addressing the initial crisis of Monique being able to feed her children, the door was opened for further discussion of Monique's other pressing concerns. Gwen and Monique had weekly telehealth sessions through much of the pandemic. As Monique learned to manage her stress level better, and as the crisis situation began to subside, Gwen also was able to assist Monique with relaxation strategies that were helpful in dealing with some of the cancer-related fears and the psychosocial effects of the chemotherapy.

Reflection Questions

1. Why do you think Gwen began, immediately, with the issue of food for the family?
2. How do you think Monique received the suggestion of food before having her other psychological concerns addressed?
3. How do you think assessing and acting on the obvious crisis first might have facilitated a longer-term counseling relationship?
4. How would you have dealt with Monique's initial call?

Crisis Context

Individual crisis situations may be as diverse as the individuals affected by crises; however, it is useful to consider typology. James and Gilliland (2017) have suggested that all individuals may face any number of developmental, personal, or environmental types of crises across the life-span. While the clinical literature naturally has emphasized the conflictual nature of a crisis, it is important to maintain the strength-based perspective that a crisis also can initiate circumstances for creating meaningful change and building resilience. A helpful operational definition of a crisis is one emphasizing that a crisis also can be a turning point in a person's life, one that promotes personal insight, self-reflection, and change (Levers, 2020). A crisis occurs when someone experiences a personal or environmental stressor or perceives some danger or threat in the environment; how the person responds is critical to whether the individual becomes overwhelmed indefinitely or is able to manage the situation in a self-efficacious way. This leads directly to a discussion about the ways in which mental health professionals can intervene, effectively, in helping clients to resolve their crises successfully.

Crisis Intervention Strategies

Whether real or imagined, a perceived sense of danger can have a profound effect on a person. It is essential that professional counselors be well equipped with crisis intervention skills. A number of crisis intervention models exist and can be used to assist clients in managing and working through their crises. Several stage/step models, the psychological first aid model, and the need for systemic responses are discussed in the text that follows.

Stage/Step Models

One general model for conceptualizing a client's concerns is the *Integrative ACT Intervention Model* (Roberts, 2002), which includes the following three stages: (a) Assessment, (b) Crisis intervention, and (c) Trauma treatment services. Roberts (2005) also has designed a *Seven-Step Crisis Intervention Model*, which is more detailed than his earlier *Integrative ACT Intervention Model* and suggests the following steps:

- Assess lethality,
- Establish rapport,
- Identify problems

- Identify problems,
- Deal with feelings,
- Explore alternatives,
- Develop an action plan, and
- Follow up.

As is the case with many stage and step-wise models, these should be considered as points of guidance and adapted to the individual needs presented by specific clients. We never should "push" client responses to fit a predetermined set of stages or steps. Like so many issues that are pertinent to counseling, working with crisis is an iterative and recursive process.

Psychological First Aid

Psychological First Aid (PFA; National Child Traumatic Stress Network & National Center for PTSD, 2006) is an evidence-based modular program, one that has been used widely in responding to crisis, disaster, terrorism, and other emergencies. The National Child Traumatic Stress Network and the National Center for PTSD, a section of the United States Department of Veterans Affairs, jointly developed PFA in 2006. PFA originated as an intervention for disaster response; it has been used extensively by the International Federation of Red Cross and the Red Crescent Societies (Schultz & Forbes, 2014), as well as by the WHO (2013). PFA has been used primarily in disaster response, but because it is a short-term intervention, intended to attenuate distress and facilitate continued care as necessary, it also may be used as a crisis intervention strategy. Due to the reality that crisis and disaster events have become increasingly prevalent, PFA has been developed as a consensus-derived, empirically supported, competency-based training model (McCabe et al., 2014). A wide array of PFA training opportunities has facilitated the use of PFA interventions during the COVID-19 pandemic (Shah et al., 2020).

Crisis Response as a System Issue

While individuals frequently face personal crises, communities and societies face crisis situations as well; therefore, a systemic perspective of crisis intervention strategies also is important. According to SAMHSA (2020b, p. 8), "A comprehensive and integrated crisis network is the first line of defense in preventing tragedies of public and client safety, civil rights, extraordinary and unacceptable loss of lives, and the waste of resources." However, SAMHSA further states that "Effective crisis care that saves lives and dollars requires a systemic approach" (2020b, p. 8). The organization advocates for comprehensive crisis care services that include (a) regional crisis call centers, (b) crisis mobile team response, and (c) crisis receiving and stabilization facilities (SAMHSA, 2020a, 2020b). Such comprehensive crisis services, by definition, address individual crises while also ensuring well-being at community and larger systemic levels.

SAMHSA advises that systemic crisis response efforts should be trauma informed. According to SAMHSA's 2020b publication, "trauma-informed care is an essential element of crisis treatment" (p. 29). In 2014, SAMHSA established the following set of key guiding principles for trauma-informed care:

1. Safety;
2. Trustworthiness and transparency;
3. Peer support and mutual self-help;
4. Collaboration and mutuality;
5. Empowerment, voice, and choice; and,
6. Ensuring cultural, historical and gender considerations inform the care provided (p. 10).

Accordingly, these key principles would inform all treatment and recovery services, including individual crisis intervention and systemic crisis response services. The major directive is to create a service delivery culture that is trauma informed, thus screening for trauma exposure among all clients, including those who are experiencing any type of crisis.

COUNSELING IMPLICATIONS

For many reasons, not the least of which are the COVID-19 pandemic and anthropogenic climate change, it is much more likely now, than ever before, that mental health professionals will be faced with responding to increased levels of stress, more intense crises, and even more frequent disasters; we need to be prepared to provide sufficient services to clients whose lives have been affected. We have seen that stress and crisis not only affect individuals but also communities and societies; stress and crisis have become serious public health issues. Precisely because of the unpredictable nature of most crises and disasters, which can cause enormous suffering and death, the WHO (2012) urges national and local systems to prepare for the unpredictable. Organized response, at this larger systemic level, has become a relatively new role for professional counselors. While such response certainly is within the scope of practice for professional counselors, little instruction concerning stress, crisis, disaster, and trauma is reflected in the mandates of professional accreditation standards. Likewise, the professional code of ethics offers little guidance for ethical conduct or practice issues related to stress, crisis, disaster, and trauma (Tarvydas et al., 2017); Tarvydas et al. (2017) have begun to address these ethical/professional lacunae by suggesting ethical guidelines for mass trauma and complex humanitarian emergencies, and thus by extension, for addressing stress and crisis (the intersections of professional ethics with crisis, trauma, and disaster are detailed in Chapter 29 of this textbook). Like Rodin's (2014) notion of the dividend that accrues from building resilient communities, we need to move the professional mindset from one that is based solely on preparedness to one that includes adaptation to the increasing stressors and crises associated with contemporary life.

CONCLUSION

This chapter has focused on identifying theories and practices associated with stress and crisis, with a particular emphasis on presenting strategies for stress management and crisis intervention. An additional aim of the chapter has been to illuminate the trauma scaffold being constructed across Chapters 1, 2, 3, and 4 as a means for developing awareness of critical foundational constructs necessary for understanding the more complex issues that are examined in the remaining chapters of this book.

Regardless of which models of stress management and crisis intervention a counselor elects to use, it is important for the counselor to maintain a focus on client needs. It also is imperative

for professional helpers to be familiar with the specific mechanisms and dynamics of the selected model and to ensure that the model is compatible with their broader clinical framework and practice. In many ways, effective stress management and crisis intervention skills form a strong foundation in responding effectively to other trauma events and disaster situations.

ADDITIONAL RESOURCES

A robust set of instructor resources designed to supplement this text is available. Qualifying instructors may request access by emailing textbook@springerpub.com.

PRACTICE-BASED RESOURCES AND REFERENCES

RESOURCES

Websites

World Health Organization. (2020, April). *Doing what matters in times of stress: An illustrated guide*. www.who.int/publications/i/item/9789240003927
Crisis Prevention Institute www.crisisprevention.com

Videos

Understanding Stresses and Strains. (1968; 9:14) www.youtube.com/watch?v=xdOf7WTf9DQ
Topic: Toxic Stress (videos) https://developingchild.harvard.edu/resourcetag/toxic-stress/
How Data From a Crisis Text Line Is Saving Lives (9:43) www.ted.com/talks/nancy_lublin_the_heartbreaking_text_that_inspired_a_crisis_help_line?language=en
Dr. Gabor Maté on How to Reframe a Challenging Moment and Feel Empowered (2019; 7:26) www.youtube.com/watch?v=_JLFw2FtEQ
Gently Dusting Off the Mind: Gabor Maté (Compassionate Inquiry; 2019; 17:25) www.youtube.com/watch?v=n9TTdP16FEY
Videos Gabor Mate: On the Connection Between Stress and Disease (2019; 1:16:45) www.google.com/search?q=video+gabor+matte&rlz = 1C1GCEA enUS815US815&oq=video+gabor+matte&aqs=chrome..69i57j0i13j0i5i13i30j0i8i13i30l2.4950j0j7&sourceid=chrome&ie=UTF-8

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for professional helpers to be familiar with the specific mechanisms and dynamics of the selected model and to ensure that the model is compatible with their broader clinical framework and practice. In many ways, effective stress management and crisis intervention skills form a strong foundation in responding effectively to other trauma events and disaster situations.

ADDITIONAL RESOURCES

A robust set of instructor resources designed to supplement this text is available. Qualifying instructors may request access by emailing textbook@springerpub.com.

PRACTICE-BASED RESOURCES AND REFERENCES

RESOURCES

Websites

World Health Organization. (2020, April). *Doing what matters in times of stress: An illustrated guide*. www.who.int/publications/i/item/9789240003927
Crisis Prevention Institute www.crisisprevention.com

Videos

Understanding Stresses and Strains. (1968; 9:14) www.youtube.com/watch?v=xdOf7WTf9DQ
Topic: Toxic Stress (videos) https://developingchild.harvard.edu/resourcetag/toxic-stress/
How Data From a Crisis Text Line Is Saving Lives (9:43) www.ted.com/talks/nancy_lublin_the_heartbreaking_text_that_inspired_a_crisis_help_line?language=en
Dr. Gabor Maté on How to Reframe a Challenging Moment and Feel Empowered (2019; 7:26) www.youtube.com/watch?v=_JLFw2FtEQ
Gently Dusting Off the Mind: Gabor Maté (Compassionate Inquiry; 2019; 17:25) www.youtube.com/watch?v=n9TTdP16FEY
Videos Gabor Mate: On the Connection Between Stress and Disease (2019; 1:16:45) www.google.com/search?q=video+gabor+matte&rlz = 1C1GCEA enUS815US815&oq=video+gabor+matte&aqs=chrome..69i57j0i13j0i5i13i30j0i8i13i30l2.4950j0j7&sourceid=chrome&ie=UTF-8

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CHAPTER 4

Neurobiological Effects of Trauma and

Neurobiological Effects of Trauma and Psychopharmacology

JOHN R. TOMKO

CHAPTER OVERVIEW

Posttraumatic stress disorder (PTSD) is a condition that is characterized by profound neurochemical and neuroendocrine changes in the central nervous system (CNS). The physical response to trauma, in those susceptible to its development, can induce physical and behavioral changes. Understanding the impact of these neural changes is the basis for developing a rational medication therapy regimen for a client diagnosed with PTSD. The use of these medications is vital for symptom management so that the benefits of counseling can be realized. This chapter will discuss the neuronal and pathophysiological impact of trauma on the brain while subsequently describing how medications can impact symptom improvement. Medications that are discussed in this chapter include the use of antidepressants, antipsychotics, and other novel agents used in the pharmacotherapy of PTSD. Both U.S. Food and Drug Administration (FDA)-approved medications and "off-label" medications are explored.

LEARNING OBJECTIVES

After reading this chapter, the reader should be able to:

1. Describe the neurochemical changes that develop as a result of trauma;
2. Recognize the core symptoms of PTSD based on the *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition criteria (*DSM-5*);
3. Explain the rationale for the use of specific medications for trauma (both FDA-approved and "off-label");
4. Recognize differences in pharmacotherapeutic treatment modalities based upon the etiology of PTSD; and,
5. Integrate knowledge of the medications into the development of an initial pharmacotherapy regimen for a client case.

INTRODUCTION

The purpose of this chapter is to explore the underlying neurochemistry and pathology of PTSD. Subsequently, medications that are commonly prescribed in the treatment of PTSD are discussed. Emphasis is placed upon the expected drug mechanism of action in the treatment of this disorder. Through the integration of knowledge of the underlying disorder, coupled with the understanding of drug mechanisms, the reader should achieve a greater appreciation of the pharmacotherapy of PTSD. Armed with this knowledge, mental health professionals can better treat and monitor their clients affected by trauma.

The goals of this chapter are achieved in the discussions found in the following sections: Physical Response to Trauma, the Brain and Physiological Impact of Trauma, The Need for Medications in the Treatment of Posttraumatic Stress Disorder, Commonly Prescribed Medications in Treatment of Posttraumatic Stress Disorder, and Counseling Implications. These discussions are followed by a closing summary and an online list of helpful resources for instructors, students, and clinicians.

PHYSICAL RESPONSE TO TRAUMA

It is generally known that physiological trauma influences a person's health, well-being, and quality of life. Recovery from trauma of this sort may be a long-term, possibly lifelong, and often incomplete process. Psychological trauma, however, may be missed or discounted upon client evaluation, leading to underdiagnosis (Blank, 1994; Grinage, 2003; McPherson, 2003). As in physiological trauma, psychological trauma recovery processes may involve long-term, possibly lifelong, care and management. Trauma of this type affects clients in quality of life, activities of daily living, and can severely influence overall functioning (Grinage, 2003). Exposure to a traumatic event can lead to traumatic stress. The traumatic stress caused by exposure to an actual or perceived risk of death or serious injury, or the threat to physical integrity of oneself or others, can lead to a potentially chronic and debilitating illness referred to asPTSD. PTSD is characterized by a cluster of symptoms that includes persistent intrusive thoughts, phobic avoidance, hyperarousal, and negative changes in cognition and mood. See Table 4.1 for a list of diagnostic criteria. These signs can express in affected clients with such behaviors as impulsivity, aggression, or even depression (American Psychiatric Association, 2013; Davis et al., 2001). Common classifications of such types of psychological or physical trauma which can induce PTSD include abuse (mental, physical, sexual, or verbal); catastrophe (accidents, natural disasters, or terrorism); violent attack (assault, rape, or battery); and combat/warfare exposure. Estimates of the lifetime prevalence of PTSD in the general adult U.S. population are 1% to 12% (Lange et al., 2000; Yehuda, 2004), with an estimated 30% of men and women who have been in war zones having been diagnosed with the disorder (Kessler et al., 1995; Kulka et al., 1990). Early life trauma is recognized as a risk factor for development of psychiatric illnesses later in life, such as major depressive disorder (MDD; Ballenger et al., 2004). It also is known that females develop the condition at between two and four times the rate as males (Grinage, 2003; Yehuda, 2002).

Clients who go on to develop PTSD after exposure to a stressful and traumatic event exhibit the hallmark signs of the disorder, which include reexperiencing of the event, avoidance of reminders of the event, and hyperarousal. Further, these symptoms express in conjunction with negative feelings or beliefs about oneself, distorted cognition, emotional detachment, isolation, or an inability to experience positive emotions. The onset of the disorder is also characterized by three different subtypes of PTSD: acute, chronic, and delayed onset. The acute PTSD subtype has a very rapid onset following the event, with symptoms lasting fewer than 3 months. Chronic PTSD symptoms may last 3 months or longer. Finally, the delayed onset client may begin experiencing symptoms of PTSD 6 months or longer following exposure to a traumatic event (American Psychiatric Association, 2013).

Psychological trauma can lead to significant changes in neurochemical and neurobiological functioning. Early life trauma has been shown to be a significant risk factor for the development of psychiatric illness later in life, including PTSD, other anxiety disorders, and depression. The neurobiological and neurochemical changes that occur as a result of early life stressors may persist or express later in life (Heim & Nemeroff, 1999, 2001). These changes have been well documented and have a significant influence upon the development of PTSD (Bremner et al., 1997; Carlson & Earls, 1997; DeBellis, Baum, et al., 1999; DeBellis, Keshaven, et al., 1999).

Table 4.1

Diagnostic Criteria for Posttraumatic Stress Disorder

The person was exposed to: death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence, in the following way(s):	
Criterion A required	1. Direct exposure 2. Witnessing the trauma 3. Learning that a relative or close friend was exposed to a trauma 4. Indirect exposure to aversive details of the trauma, usually in the course of professional duties (e.g., first responders, medics)
Criterion B1 required	The traumatic event is persistently re-experienced, in the following way(s): 1. Intrusive thoughts

	2. Nightmares 3. Flashbacks 4. Emotional distress after exposure to traumatic reminders 5. Physical reactivity after exposure to traumatic reminders
Criterion C1 required	Avoidance of trauma-related stimuli after the trauma, in the following way(s): 1. Trauma-related thoughts or feelings 2. Trauma-related reminders
Criterion D2 required	Negative thoughts or feelings that began or worsened after the trauma, in the following way(s): 1. Inability to recall key features of the trauma 2. Overly negative thoughts and assumptions about oneself or the world 3. Exaggerated blame of self or others for causing the trauma 4. Negative affect 5. Decreased interest in activities 6. Feeling isolated 7. Difficulty experiencing positive affect
Criterion E2 required	Trauma-related arousal and reactivity that began or worsened after the trauma, in the following way(s) 1. Irritability or aggression 2. Risky or destructive behavior 3. Hypervigilance 4. Heightened startle reaction 5. Difficulty concentrating 6. Difficulty sleeping
Criterion F required	Symptoms last for more than 1 month
Criterion G required	Symptoms cause significant distress or functional impairment
Criterion H required	Symptoms are not due to medication, substance use, or other illness

Source: Adapted from Department of Veteran Affairs, Department of Defense. (2017, June). *VA/DoD clinical practice guideline for the management of posttraumatic stress disorder and acute stress disorder*). https://www.healthquality.va.gov/guidelines/MH/ptsd/VADoDPTSDCPGFinal012418.pdf

Although many people have been exposed to trauma in their lives, only a portion go on to develop the signs and symptoms of PTSD. It is estimated that 70% of the world's population has been exposed to trauma, while an estimated 6% of exposed individuals progress onward to develop PTSD (Koenen et al., 2017). Estimates of PTSD development in combat veterans may be as high as 25% (Fulton et al., 2015). The factors for the risk of the development of PTSD are not fully understood. The experiencing of abusive relationships, victimization of physical or mental abuse, surviving violent attacks or overtures, witnessing a violent act or traumatic event, or being interjected into a violent or disturbing situation do not necessarily cause a person to develop PTSD. Clients' risk for development of the disorder and their resilience following exposure to an event are areas that require further study. Studies suggest that previous exposure to trauma and intensity of the response to acute trauma may affect the development of PTSD. Neurochemical changes, particularly lower cortisol levels, may influence information processing of traumatic memories and may be associated with the underlying pathology of PTSD (Yehuda, 2004).

THE BRAIN AND PHYSIOLOGICAL IMPACT OF TRAUMA

Following a traumatic event or witnessing a traumatic event, the CNS begins to develop neurochemical pathways and physiological adaptations to respond to the situation. Areas of the brain which involve memory, such as the amygdala and hippocampus, have increased reactivity to stimuli following acute situations (Yehuda, 2002). People also develop changes in hippocampus function and memory processing, suggesting a possible reason for the symptoms of reexperiencing of a traumatic event. PTSD also has shown increased synaptic

symptoms of reexperiencing of a traumatic event. PTSD also has shown increased synaptic activity of norepinephrine in the CNS which is the neurotransmitter released from the locus coeruleus and responsible for the "fight-or-flight" response, as well as increased reactivity of the alpha-2 adrenergic receptors, stimulation of which is responsible for increased heart rate, blood pressure, and anxiety response. Increased norepinephrine, coupled with increased sensitivity of the adrenergic binding sites, promote worsening of the anxiety symptoms common in PTSD (Southwick et al., 1999). Following exposure, persons that have developed PTSD are shown to have significantly higher norepinephrine levels when compared to unaffected controls (Pan et al., 2018).

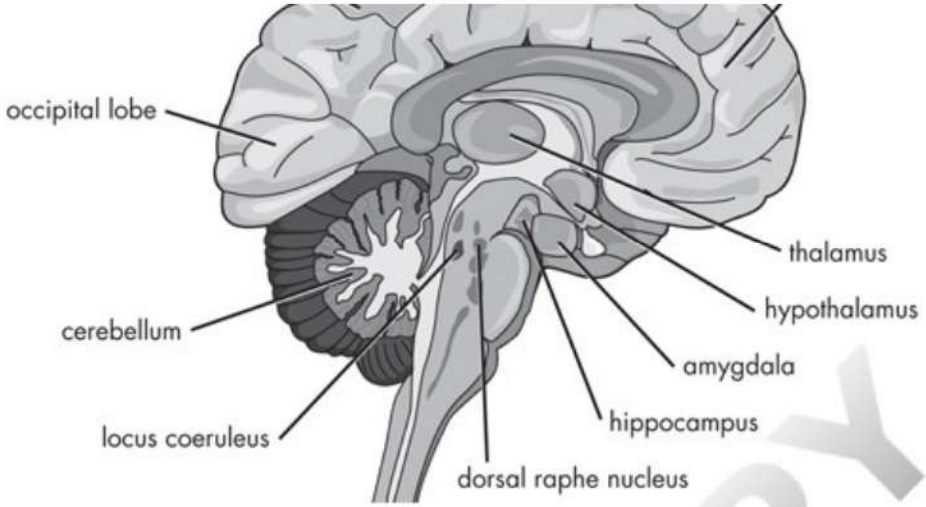
PTSD, similar to anxiety disorders such as generalized anxiety disorder and panic disorder, are characterized by a CNS imbalance between two distinct neurotransmitters, serotonin and norepinephrine. Serotonin, which is responsible for mood regulation in the brain, is found to be normal to slightly diminished in anxiety disorders. The serotonin center of the brain is located within the upper brainstem in the form of two organelles, the dorsal and rostral raphe nuclei. The raphe nuclei release serotonin for mood regulation as well as other bodily functions such as gastrointestinal regulation, skeletal muscle tone, platelet function, and temperature regulation. Located just near the rostral raphe nuclei is the norepinephrine center of the brain, the locus coeruleus. Norepinephrine release from the locus is greatly increased in trauma and anxiety disorders. Increases in norepinephrine in the brain and periphery are characterized by anxiety, tremors, increased focus, increases in blood pressure, and tachycardia. When an increase in norepinephrine is overlaid with normal to decreased serotonin function, clients present with symptoms attributable to psychic anxiety (Charney et al., 1987). Centrally within the brain and spinal cord, clients present with nervousness, agitation, sleep disturbances, hypervigilance, and heightened memory and thought processing. Peripherally, clients may present with physiological or somatic symptoms of anxiety such as tachycardia; high blood pressure; rapid, shallow breathing; and tremors (see Figure 4.1).

Another type of physiological change that is unique to PTSD, in contrast to the other anxiety disorders, involves CNS and peripheral adaptation of the body's response to corticotropin-releasing hormone (CRH) from the pituitary gland, located in the basal anterior portion of the brain. The pituitary gland works on a feedback mechanism in conjunction with the hypothalamus (located in the midbrain) and the adrenal glands, located on the dorsal area of the kidneys. These organs comprise the hypothalamus–pituitary–adrenal axis (HPA axis). In normal body function, CRH is released by the pituitary gland, located in the basal anterior portion of the brain. The normal progression of function of the HPA axis is as follows: CRH is released from the hypothalamus, which in turn signals the pituitary gland to release adrenocorticotropic hormone (ACTH), otherwise called corticotropin. Corticotropin release causes the adrenal glands to release cortisol, a glucocorticoid which has many responsibilities in the body, one of which is mitigation of the stress response. In PTSD, altered response to CRH occurs. Increased levels of CRH are detected in PTSD clients; however, there is diminished response to this CRH release in the pituitary. Therefore, based upon the normal progression of the HPA axis, greatly decreased levels of cortisol are released from the adrenal glands. The net effect is decreased levels of cortisol, which produces a diminished stress response from the body (Yehuda, 2002). Decreased release of cortisol has been evidenced by significantly decreased 24-hour urinary cortisol concentrations in those that have developed PTSD (Pan et al., 2020).

Figure 4.1

Brain Structures That Are Affected by Trauma

Take particular notice of the location of the locus coeruleus, dorsal raphe nucleus, amygdala, hypothalamus, and hippocampus.

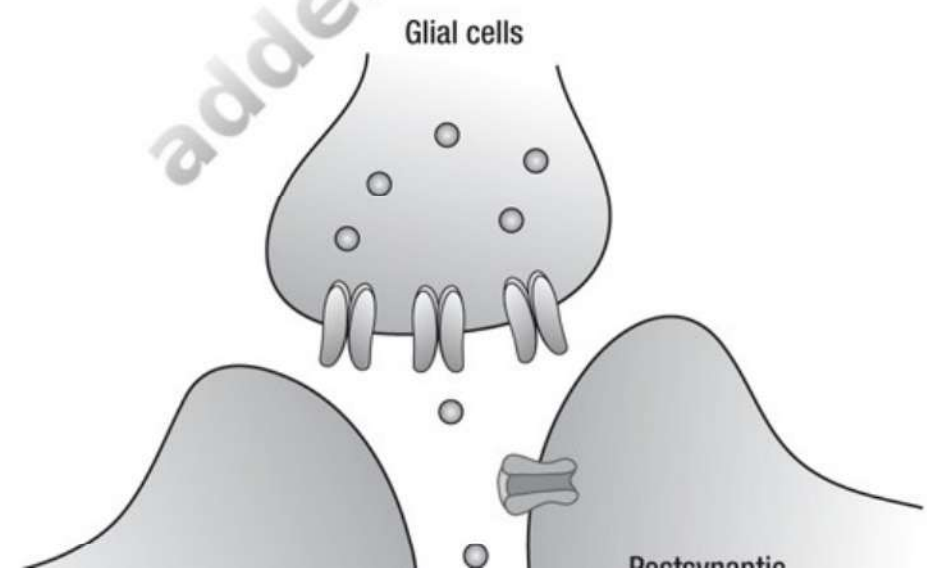


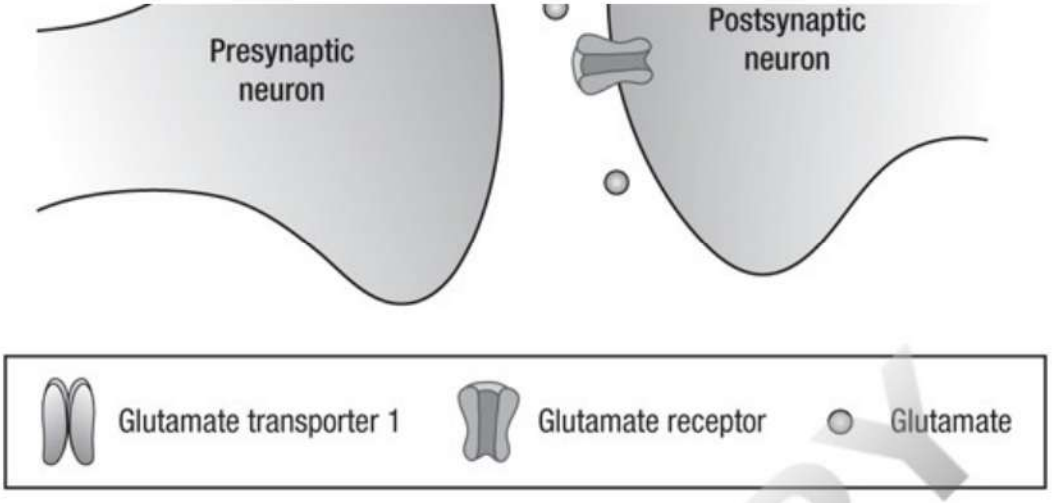
Source: Adapted from Lundbeck Institute. (2000). *The areas of the brain affected in phobia*. CNS Forum. http://www.cnsforum.com/imagebank/item/Neuro_biol_PHB/default.aspx

With the presence of a pronounced norepinephrine effect, coupled with a diminished cortisol response, clients who develop PTSD may have an increased and protracted exposure to high levels of norepinephrine. This norepinephrine increase, coupled with an imbalance of normal serotonin concentrations, may cause clients to express signs and symptoms similar to anxiety disorders. In addition to the stress and anxiety response caused as a part of norepinephrine increase, the PTSD client also presents with diminished cortisol production. Because cortisol is attributed to mitigation of the stress response through neuroprotection, the amygdala and hippocampus memory areas of the brain are subject to a sustained exposure to high norepinephrine levels. This sustained exposure to high norepinephrine leads to increased levels of norepinephrine within the cerebrospinal fluid, leading to increased and prolonged excitability and signaling within the CNS. In the absence of the neuroprotective effects of cortisol, sustained norepinephrine exposure within the amygdala and hippocampus may lead to an ingrained response to the offending stimuli. Research has shown that, in addition to amygdala and hippocampal damage, high levels of unchecked norepinephrine may be a possible trigger to emotion expression in the prefrontal cortex area of the brain, the area attributed to executive functioning (Arnsten, 2007). It further has been shown that there are definitive changes in the locus coereleus in some diagnosed PTSD clients on autopsy, which possibly may be a reason for prolonged norepinephrine response (Bracha et al., 2005).

Figure 4.2

Relationship of Glial Cells (Astrocytes) to Neuronal Synapse





Another proposed contributor to the development of PTSD has been the amino acid-based pathology (ABP). Whereas prior theories have emphasized the monoamine theory (e.g., norepinephrine excess), the ABP theory suggests that there is greatly dysregulated glutamatergic activity; thus, excessive release of glutamate from the glial cells results in synaptic damage. As a stimulatory signaling amino acid released from the astrocytes (glial cell), excessive release of glutamate may result in excessive stimulation, loss of neural plasticity, and synaptic damage (Abdallah et al., 2019). See glial cell location in Figure 4.2.

In the treatment of PTSD, psychotherapies (talk therapies) have been considered the mainstay of treatment. Some of the more familiar therapies include several strategies such as cognitive behavioral therapy (CBT) in the form of exposure therapy, stress inoculation, cognitive therapy, and Eye Movement Desensitization and Reprocessing (Seedat et al., 2005), and therapy may include combinations of these CBT methods (Bryant et al., 1999). Supportive counseling also has been employed (Bryant et al., 1998). Clients engage in these therapies to de-escalate, discover root causes of behaviors and reactions, and develop new coping mechanisms to manage the stressors brought about by the trauma response.

As we already know, PTSD is characterized by the four sets of core symptoms exhibited by the disorder; that is, reexperiencing, avoidance, persistent negative alterations in mood and cognition, and hyperarousal. These symptoms persist for greater than 1 month. During psychological treatments, or in the performance of activities of daily living, core symptoms may cause inordinate anxiety, which can pose significant barriers to successful emoting of feelings, beliefs, and reactions. Inability to manage these barriers subsequently may lead to suboptimal outcomes throughout the course of treatment, causing clients to feel overwhelmed and hindering therapeutic alliance formation during these therapeutic encounters. In cases such as these, the addition of medication therapies is warranted. Individuals diagnosed with mild acute PTSD may not need medications to engage in psychotherapy. Clients with the diagnoses of mild chronic PTSD, severe acute PTSD, and severe chronic PTSD would benefit from the dual treatment modalities that combination pharmacotherapy and psychotherapy can provide. Therefore, the choice of whether or not to use medications is based upon severity and duration of symptoms.

The medications used for the treatment of PTSD work on one or all of the core symptoms, allowing the client to engage fully in psychological therapies to gain maximal benefit from treatment. These medications provide the client with resolution of the symptoms during activities of daily living and in psychotherapy sessions, giving clients a better opportunity to experience improved day-to-day functioning while simultaneously allowing them to apply the coping mechanisms garnered during these therapy sessions.

THE NEED FOR MEDICATIONS IN THE TREATMENT OF POSTTRAUMATIC STRESS DISORDER

Medications have become a valuable management tool in the treatment of PTSD. Although

talk therapies such as CBT, group therapies, Eye Movement Desensitization and Reprocessing, and others are effective in the treatment of this disorder, medications are a welcome addition to the treatment armamentarium of clinicians. Medications have been shown to be helpful in the management of core symptoms of the disorder, which can aid clients in their engagement in various psychotherapies and assist persons afflicted with the disorder in improving their function in activities of daily living.

Many different agents have been employed in the medical treatment of PTSD, despite the fact that many of these agents do not have approval from the FDA for PTSD treatment. When medications are used that do not have FDA approval for treatment of a specific condition, despite the fact that there is evidence demonstrating effectiveness of the agent, the use of the agent in such circumstances is termed "off-label use" in practice. Most medications that are used to treat PTSD are employed "off-label." Currently, only two medications have FDA approval for the treatment of PTSD. The following sections discuss the various classes of drugs employed in treatment, both FDA-approved medications and off-label medications. The list of commonly prescribed medications, both approved and off-label, are provided in Tables 4.2 to 4.4.

COMMONLY PRESCRIBED MEDICATIONS IN TREATMENT OF POSTTRAUMATIC STRESS DISORDER

Antidepressants: Selective Serotonin Reuptake Inhibitors

Selective serotonin reuptake inhibitor (SSRI) agents are a class of medication that have been studied and used extensively in the treatment of various medical conditions. Each individual agent (with the exception of fluvoxamine) has been approved by the FDA for the treatment of MDD. They also carry FDA approvals for the treatment of various anxiety disorders; however, each individual agent may carry approvals for specific subsets of anxiety disorders.

The mechanism of action of these agents, as described by their drug class, is the prevention of serotonin reuptake into the neural presynaptic vesicles. Simply put, these agents prohibit serotonin from being reabsorbed into the presynaptic nerve terminal, thereby increasing the amount of serotonin available in the nerve synapse. By increasing the available serotonin in the synapse between the neurons, there is an increased amount of serotonin available to stimulate the postsynaptic neuron. Increasing serotonin stimulation at the postsynaptic neuron allows more serotonin-mediated signaling to be carried forth. As previously discussed, serotonin is responsible for mood regulation. Therefore, by increasing serotonin stimulation, clients can see improvement in mood symptoms (Stahl, 2000).

Table 4.2
Antidepressants That Have Been Used in Posttraumatic Stress Disorder

Generic name	Brand name	Usual dosage range (mg/day)
SSRIs		
Sertraline[#]	Zoloft	25–200
Paroxetine[#]	Paxil	20–60
	Paxil CR	12.5–62.5
Citalopram	Celexa	20–60
Escitalopram	Lexapro	10–20
Fluoxetine	Prozac	20–80
Fluvoxamine	Luvox[*]	25–300
SNRIs		
Venlafaxine	Effexor	37.5–225
	Effexor XR	
Duloxetine	Cymbalta	20–120
Mixed mechanism agents		

Mixed mechanism agents		
Mirtazapine	Remeron	15–45
Bupropion	Wellbutrin	75–450
	Wellbutrin SR	
	Wellbutrin XL	
Nefazodone	Serzone*	100–600
Trazodone	Desyrel*	50–600
Tricyclic agents		
Amitriptyline	Elavil*	25–300
Imipramine	Tofranil*	25–300
	Tofranil PM	
Desipramine	Pamelor	25–300
MAOI		
Phenelzine	Nardil	45–90

#FDA approved for PTSD.
*Brand name discontinued; generic available.
FDA, U.S. Food and Drug Administration; MAOI, monoamine oxidase inhibitors; PTSD, posttraumatic stress disorder; SNRI, serotonin-norepinephrine reuptake Inhibitor; SSRI, selective serotonin reuptake inhibitors.

This mechanism has been shown to be quite useful in treating MDD, where there is a decrease in serotonin as well as a decrease in norepinephrine. By increasing synaptic serotonin in MDD, the locus coeruleus may respond as well by increasing norepinephrine output. Therefore, serotonin and norepinephrine achieve a balance, which improves mood, energy, and concentration. Trauma and anxiety disorders, however, have a different type of neurochemical imbalance. Anxiety disorders, such as generalized anxiety disorder and panic disorder, as well as PTSD, exhibit an increased amount of norepinephrine in the CNS, contrasted with a relative decrease in serotonin, leading to neurochemical balance. Because CNS serotonin is decreased in anxiety disorders, the attributes of norepinephrine are exhibited that are characteristic of anxiety: psychic anxiety, tremulousness, somatic anxiety, hyperreactivity, increased blood pressure, and increased heart rate. Because the effects of increased norepinephrine express in anxiety disorders due to the inability of serotonin to offset the increase, SSRI agents are helpful in managing all three core symptoms of PTSD through an increase in available serotonin, creating a balance between serotonin and norepinephrine.

Table 4.3
Antipsychotic Agents That Have Been Used in Posttraumatic Stress Disorder

Generic name	Brand name	Usual dosage range (mg/day)
Atypical agents		
Risperidone	Risperdal	2–6
Quetiapine	Seroquel	200–900
	Seroquel XR	
Olanzapine	Zyprexa	5–40
Ziprasidone	Geodon	40–200
Typical agents		
Haloperidol	Haldol*	2–100
Fluphenazine	Prolixin*	2.5–40
Perphenazine	Trilafon*	8–64

*Brand name discontinued; generic available.

Table 4.4

Adjunctive Agents Used in Posttraumatic Stress Disorder*

Generic name	Brand name	Usual dosage range (mg/day)
Clonidine	Catapres	0.1–0.6
Guanfacine	Tenex	1–3
Prazosin	Minipress	1–20

*No agents approved for PTSD.

Upon examination, core symptoms of PTSD can be attributed to increases in CNS norepinephrine as well as decreases in serotonin. Reestablishing this balance can help to improve core symptoms and improve client daily functioning. Clients also are able to participate in their psychological treatments in a more enriching manner and to function at a higher degree in their daily lives.

SSRI agents are considered first-line agents in the pharmacotherapy of PTSD and have been used extensively in client treatment. Of the SSRIs, the only ones that have been approved by the FDA for the treatment of PTSD are sertraline (Zoloft, 2010) and paroxetine (Paxil, 2010). Additionally, they are the only two of any medication class that are FDA approved for the treatment of PTSD. This is not to say that other SSRIs have not been used "off-label" in the treatment of PTSD. As discussed earlier in this chapter, many of these medications have been used off-label in PTSD treatment. This practice is common in medicine, and the use of unapproved agents to treat various conditions sometimes may be considered the standard of practice. An everyday example of this is the use of a daily aspirin tablet for treatment post-heart attack or stroke. Aspirin was never approved by the FDA for this; nonetheless, the agent has been studied and shown to decrease the risk of developing another coronary event by inhibiting platelet aggregation. Likewise, many SSRI agents also have been employed in the treatment of PTSD.

If we stop and take a brief moment to examine the root causes of the psychic and somatic symptoms of PTSD, it can be seen that, based upon the serotonin and norepinephrine imbalance, SSRI agents should be quite effective in restoring balance. Of primary concern, however, is an

effect that was discussed; if serotonin is stimulated from the raphe nuclei, a reflexive increase in norepinephrine may occur from the locus coeruleus that may occur more rapidly than the serotonin increase. In order to prevent this, dosing of SSRI agents in PTSD treatment, as well as in other anxiety disorders, usually begins at the low end of the dosing range. Once the client shows a positive improvement from the selected agent, the dose is titrated upward slowly, observing the client for worsening anxiety symptoms. If no worsening occurs, the client continues to be titrated slowly upward to higher drug doses.

It should be kept in mind that SSRI agents do not exhibit an immediate onset of effect. These agents increase synaptic serotonin concentrations slowly, gradually allowing the serotonin concentration to increase in the neural synapses. This concentration increase should occur over 8 to 12 weeks in PTSD, which is slightly longer than in other anxiety disorders or depression; therefore, the resolution of symptoms occurs over time. Clients who are treated with SSRI agents should be educated to have patience for the onset of optimal drug effects. It is also important for them to understand that adherence to psychotherapies and medications will provide them with the best opportunity for positive treatment outcomes.

As SSRI medications begin their action, stimulation caused by increased serotonin may improve mood and offset anxieties with a concurrent increase in headache, nausea, and diarrhea. Some of these side effects may be self-limiting, and as the CNS and gastrointestinal (GI) tract accommodate, the side effects should subside. If they do not subside within a few weeks, clients may need to switch the medication to a different SSRI or other medication treatment. Other side effects that are attributed to the use of SSRI agents include changes in sexual drive or sexual dysfunction as well as weight gain, both of which may be particularly distressing in younger clients.

Although SSRI agents are considered first-line pharmacotherapy, these agents have been shown to be more effective in the treatment of civilian trauma such as domestic violence, rape, and mental abuse as opposed to combat-related trauma. SSRIs may have some value in combat-related trauma, and modest improvement seen in combat-related stress may be caused by lack of chronicity of illness in younger clients, confounded by their use in predominantly male populations (Hertzberg et al., 2000; Zohar et al., 2002). It also has been shown that both paroxetine and sertraline have improved short-term outcomes in PTSD (Beebe et al., 2000; Brady et al., 2000; Davidson, Rothbaum, et al., 2001); however, sertraline also exhibits the added benefit of long-term symptom improvement (Davidson, Pearlstein, et al., 2001). Other types of antidepressants or medications have shown improvement on Clinician Administered PTSD Scale (CAPS) scores than SSRI agents in Veterans Administration-treated clients (Davis et al., 2002).

Other Antidepressants: Adjunct Medications

Although no other antidepressants other than the SSRIs sertraline and paroxetine carry FDA approval for the treatment of PTSD, we know that others are used off-label for treatment. Such is the case for the following classes of antidepressants.

Serotonin-Norepinephrine Reuptake Inhibitors

Perhaps the best studied of these agents in the treatment of PTSD is venlafaxine. Venlafaxine is FDA approved and has been used in the treatment of MDD, generalized anxiety disorder, panic disorder, and social anxiety disorder in order to increase serotonin concentrations at the neural synapse, much in the same way SSRI agents do. The agent is not FDA approved for the treatment of PTSD; however, it has been used for treatment (Hamner & Frueh, 1998; Smajkic et al., 2001). What is interesting about venlafaxine is that it inhibits serotonin at approximately 10 times the rate of inhibiting norepinephrine. Therefore, this medication is usually dosed at the lower dose ranges in anxiety disorders. If doses exceed 225 mg per day, the norepinephrine effects begin to become significant, leading to anxiety and increases in blood pressure. Therefore, venlafaxine is prescribed and FDA approved for anxiety disorders in doses less than 225 mg per day (Preskorn, 1994). Venlafaxine, although effective, exhibits some side effects that are more severe than those found with SSRIs, namely nausea and

some side effects that are more severe than those found with SSRIs, namely nausea and headache (Agency for Healthcare Quality and Research, 2007).

Another agent considered an SNRI is duloxetine. Duloxetine is an antidepressant that exhibits both serotonin and norepinephrine reuptake inhibition and is approved for the treatment of MDD, generalized anxiety disorder, diabetic nerve pain, and fibromyalgia (Cymbalta, 2010). Results of trials of duloxetine in PTSD have shown mixed results, and this agent is generally not used in PTSD. One such study indicated that duloxetine may have some benefit in the treatment of PTSD by causing improvements in sleep (Walderhaug et al., 2010). In contrast, another study has shown exacerbations of PTSD core symptoms with the use of the agent (Deneys & Ahearn, 2006). It also should be kept in mind that duloxetine carries a contraindication to use in alcoholism and liver dysfunction. Because substance dependence can co-occur at a high rate in the PTSD client, consideration should be given to the possibility of comorbid alcohol abuse in the PTSD client.

Mirtazapine

Mirtazapine is an agent that has been used adjunctively, or in addition to primary medication treatment, in the treatment of PTSD. Very few clinical studies supporting the use of mirtazapine have been performed; however, its ability to help with sleep induction is the reason it is used as an add-on agent to the primary antidepressant. The drug has a unique mechanism of action, a centrally acting synaptic α2 antagonist. In the neural synapses, α receptors are present that interact with sympathetic neurotransmitters such as norepinephrine. Interacting with α2 receptors on the presynaptic surface of the nerve within the brain (e.g., centrally acting agent) causes negative feedback. This negative feedback leads to a release of serotonin and norepinephrine from the presynaptic vesicles contained in the terminal of the neuron. In summary, the effect makes more serotonin and norepinephrine available to stimulate the postsynaptic neuron receptors, allowing for increased action and transmission from these neurotransmitters (RemeronSolTabs, 2010). Mirtazapine also possesses antihistamine activity, which can cause drowsiness, especially at lower doses (de Boer, 1996). As stated earlier, the drug has been employed in anxiety disorders and depression for sleep in conjunction with the primary antidepressant. Therefore, this agent is used as a part of combination therapy and not as a primary treatment.

Tricyclic Antidepressants

The tricyclic antidepressants (TCA) are some of the oldest marketed antidepressants available. These drugs work by inhibiting reuptake of serotonin and norepinephrine into the neural presynaptic vesicles, thereby increasing the availability of neurotransmitters. This mechanism may sound familiar; the action is similar to the SNRI agents. Unfortunately, these agents also possess action at many other receptor systems in the body, leading to adverse effects. TCA agents interact with the cholinergic system, blocking acetylcholine effects and leading to such side effects as dry mouth, constipation, and urinary retention. They also have an antihistamine effect, leading to drowsiness. TCA agents also can cause cardiac-related adverse effects through blockade of α1 receptors and calcium channel blockade. These interactions can lead to orthostatic hypotension and some cardiac arrhythmias, especially in higher doses. Based on the increased risk of adverse effects with the TCA agents, they are not employed as first-line pharmacotherapy in PTSD today, nor are they approved for use by the FDA.

TCAs that have historically been used in PTSD include desipramine, amitriptyline, and imipramine. These agents were used in the treatment of the disorder prior to the advent of SSRI agents. In the past, amitriptyline was used as a treatment of PTSD much in the same way as SSRI and SNRI agents are employed today. Despite its use, most clients still continued with persistent symptoms of the disorder despite attempts to optimize dose. In one study (Davidson et al., 1990), clients receiving amitriptyline showed greater improvement if they presented with another comorbid disorder versus placebo; however, recovery rates were low in the presence of comorbid disorders such as depression, panic disorder, and alcoholism. Imipramine also has been used historically for management of PTSD symptoms with similar results to amitriptyline (Frank et al., 1988). Bearing this in mind, newer agents such as the

results to amitriptyline (Frank et al., 1988). Bearing this in mind, newer agents such as the SSRI drugs provide much more effective treatment of core symptoms than their older counterparts.

Nefazodone and Trazodone

This agent has been used in the treatment of depression and other anxiety disorders; however, nefazodone is not FDA approved for the treatment of PTSD. Nefazodone is considered a mixed mechanism antidepressant. These agents exhibit a mixed effect upon serotonin; they can work upon serotonin reuptake inhibition like an SSRI, but also block the action of serotonin at certain serotonin receptor subtypes in the post-synapse area (Nefazodone, 2010). This is theorized to improve serotonin transmission through the serotonin receptor subtypes that help to improve mood and anxieties. Nefazodone has been used to improve some PTSD symptoms, subjectively improve sleep quality, and decrease nightmares (Nefazodone, 2010). It also has been shown to cause PTSD symptom improvement in combat-related stress as well as in domestically induced stress (Asnis et al., 2004).

The use of nefazodone has fallen out of favor in recent years, since the inclusion of a "black box" warning from the FDA. It was determined that nefazodone can cause increased risk of irreversible hepatic failure, resulting in death or need for liver transplantation. Clients should be advised to be alert for early signs and symptoms of liver dysfunction (e.g., jaundice, anorexia, gastrointestinal complaints, malaise) and to report them to their doctor immediately if they occur (Frank et al., 1988). Clients who are taking nefazodone should be adherent to physician appointments in order to have their hepatic function monitored by their physician.

Trazodone is another agent with a similar mechanism as nefazodone. Because this agent has a serotonergic effect, it was thought that it would be effective in PTSD. Earlier clinical trials have alluded to this. A preliminary study in PTSD clients showed that trazodone was effective on all three core symptoms of PTSD (Hertzberg et al., 1996). Despite this encouraging data, trazodone is known to cause excessive sedation. Therefore, further trials of the agent were studied as an adjunctive agent, in addition to a primary antidepressant, for improvement of sleep and prevention of nightmares. Insomnia, nightmares, and next-day anger all have been improved. Consequently, trazodone is used in addition to antidepressant agents for improvement in sleep dysregulation due to coexisting depression (Mellman et al., 2003).

Monoamine oxidase inhibitors

Antidepressants such as SSRI, SNRI, and TCA agents are known to produce their mechanism of action by prevention of neurotransmitter reuptake into the presynaptic vesicles, leading to increased concentrations of serotonin and norepinephrine available in the neural synapse. In the synapse between neurons, the enzyme monoamine oxidase (MAO) also is present. Its purpose is to degrade excess neurotransmitters such as serotonin and norepinephrine (MAO type A inhibitor [MAOI-A]) and dopamine (MAOI-B). MAOI agents inhibit the enzyme MAO, thus allowing greater concentrations of neurotransmitters to be present in the synapse by preventing their degradation. The agent phenelzine has been used for this purpose in PTSD. This drug has been used in PTSD and, further, has been shown to be effective in the treatment of combat-related stress (Kosten et al., 1991).

Despite their effectiveness, many severe adverse events limit their use in treatment. Clients who are prescribed MAOI agents must be aware of the drug–food interaction with foods containing tyramine. Tyramine restriction is necessary, as tyramine is a precursor of the production of norepinephrine. Ingestion of tyramine-containing foods can lead to increased norepinephrine production. This increase, coupled with the inhibition of the breakdown of norepinephrine caused by MAOI action, may cause a dangerous medical condition known as hypertensive crisis. Hypertensive crisis is the increase in blood pressure to sustained, dangerously high levels. Therefore, clients should be told to avoid such foods as aged cheeses, red wine, legumes, and organ meats. Increased intake of tyrosine should be avoided as well because tyrosine is the precursor to serotonin synthesis.

MAOI drugs are also notorious for numerous drug–drug interactions. Because these drugs

MAOI drugs are also notorious for numerous drug–drug interactions. Because these drugs inhibit neurotransmitter degradation, the clinician should be careful to avoid MAOI use in clients who are taking other medications which increase neurotransmitter concentrations. Agents used for asthma, attention deficit disorder, Parkinson's disease, certain pain medications (tramadol and meperidine), weight loss medications, dextromethorphan, and even other antidepressants can cause serious, life-threatening interactions. Because of the comorbidity of substance abuse with PTSD, drugs such as amphetamines, cocaine, 3,4-methylenedioxymethamphetamine (MDMA [Ecstasy]), and lysergic acid diethylamide (LSD) can interact with MAOI agents, leading to the same deadly interactions. Because of the potential for these types of drug and food interactions, MAOI agents like phenelzine have been relegated to last-line pharmacotherapy in the treatment of PTSD. Additionally, MAOI agents are not FDA approved for PTSD.

Bupropion

Bupropion has been tried as a possible alternative to SSRI agents as a treatment for PTSD symptoms but has not been approved by the FDA for the treatment of PTSD. The drug works not through serotonin reuptake but upon preventing the reuptake of dopamine and norepinephrine into presynaptic vesicles. Bupropion has been used as a first-line agent in the treatment of depression in clients where sexual dysfunction caused by SSRI agents may be problematic. The use in PTSD, however, has been limited. In one small study (Cañive et al., 1998), the improvement seen in hyperarousal symptoms was significant but was less significant than the change in depressive symptoms in subjects with both PTSD and depression. There was no significant change in reexperiencing, avoidance, or total CAPS scores. Therefore, PTSD symptoms remained essentially unchanged (Cañive et al., 1998).

There has been little research in the form of placebo-controlled studies using bupropion in the treatment of PTSD. Bupropion has been studied in smoking cessation in clients who have been diagnosed with PTSD and was found to be effective for this use; however, no effect was seen upon PTSD symptoms. In this study (Hertzberg et al., 2001), clients were allowed to continue with their previous PTSD treatment, leading to the belief that this agent is an effective smoking deterrent in clients with PTSD. In yet another study (Becker et al., 2007) of 30 clients taking bupropion, and compared to a placebo-controlled group, no between-group differences were found between placebo and bupropion. Despite this, a post hoc analysis of responders showed that clients not previously prescribed an antidepressant were more likely to respond to bupropion (Hertzberg et al., 2001).

Further study of this agent is needed before recommendation of its use can be made in PTSD. The role of bupropion would most likely be as a second-line agent in clients who have experienced severe sexual dysfunction with serotonergic antidepressants.

Antipsychotic Agents: Atypical Antipsychotics

The term "atypical" can be considered almost a misnomer today. This term is used to identify the newer antipsychotic agents, which inhibit serotonin and dopamine activity. The older agents, also known as the "typical" agents, neuroleptics, or phenothiazines, work predominantly on dopamine blockade. Therefore, the newer agents work somewhat differently than the historical agents, hence "atypically." The most studied of these newer agents in the treatment of PTSD are risperidone, olanzapine, and quetiapine. Older "typical" agents such as haloperidol have been used as well.

Both typical and atypical antipsychotics have been used in the treatment of PTSD. Currently, the atypical agents are much more commonly used in pharmacotherapy. Antipsychotic agents have been used as add-on therapy in PTSD clients, especially on reexperiencing symptoms in which there has been inadequate symptom resolution with an antidepressant (Bartzokis et al., 2005; Pivac et al., 2004). Because of dopamine blockade, either of these classes can induce involuntary movement disorders similar to Parkinson's disease. The atypical agents, when used in the recommended dosages, have a much lower propensity to induce these movements. Atypical agents, however, can cause such things as weight gain, increase in serum cholesterol, and increased blood glucose, all of which may

lead to worsening hypertension. Clients who are prescribed these medications should be monitored for all of the aforementioned adverse events during therapy.

Recently, information regarding the use of atypical agents in the treatment of combat-related PTSD have questioned their effectiveness. One such study found that the use of risperidone in this subset of traumatized clients, who were also resistant to SSRIs, was no more effective than placebo on the reduction of symptoms as measured by the CAPS scale (Krystal et al., 2011).

Antihypertensive Agents

Certain medications that have been used for the treatment of hypertension (high blood pressure) have been used in the treatment of PTSD for reduction of nightmares. In order to understand how these medications can be helpful in PTSD, we need to understand a bit about how these medications are believed to cause this effect. Prazosin, a postsynaptic α1 antagonist, works by decreasing the stimulation of norepinephrine on the postsynaptic receptors by blocking these receptors. Therefore, norepinephrine action (also called sympathetic outflow) is decreased, leading to increased drowsiness and decreased anxiety. Prazosin has been used in combat-related PTSD in the veteran population (Raskind et al., 2000).

Other agents that have been used for this purpose include clonidine and guanfacine. These agents are centrally acting presynaptic α2 agonists. This means that the drugs attach to the α2 receptors on the nerve terminal. They stimulate these receptors just as norepinephrine would. By stimulating the neuron in this way, the drug provides a negative feedback to the neuron. This essentially tricks the neuron into believing that there is an adequate supply of norepinephrine available in the synapse, causing a decrease in the amount of available norepinephrine in the synapse. The decreased norepinephrine, in turn, decreases the sympathetic outflow, similar to the effect of the aforementioned prazosin (Harmon & Riggs, 1996).

Benzodiazepines

It is interesting to note that benzodiazepine agents have been shown to be of no benefit in PTSD. Benzodiazepines exert their effect by increasing the effect of gamma-aminobutyric acid (GABA). GABA is the predominant inhibitory neurotransmitter within the CNS. Increases in GABA decrease the effect of norepinephrine, leading to anxiety relief (Stahl, 2000). Many of these agents are used as short-term therapy in other anxiety disorders, such as generalized anxiety disorder, in order to cause rapid decrease of the intrusive anxiety symptoms until the predominant drug therapy begins to exert its effect (SSRI agents). Examples of medications in this class include lorazepam, diazepam, alprazolam, and clonazepam. Paradoxically, and perhaps surprisingly, these agents have been shown to produce no positive benefits in PTSD, with no effect on reexperiencing, hypervigilance, or avoidance (Braun et al., 1990). Likewise, early administration following trauma exposure did nothing to prevent development of PTSD (Gelpin et al., 1996). Therefore, because benzodiazepine agents have been shown to be of no benefit in PTSD, their use is discouraged in this population.

Combat-Related Stress; Variations in Recommended Pharmacotherapy

As discussed earlier, Department of Defense and Veterans Administration treatment guidelines for PTSD differ from the pharmacotherapy of domestic-related stress. Table 4.5 provides the level of evidence for the use of each agent in the treatment of combat-related stress. Notice that sertraline and paroxetine are recommended although the evidence for their use is moderate. Additionally, prazosin is only recommended for the treatment of PTSD-associated nightmares. Antipsychotic agents such as risperidone or quetiapine, other antidepressants, and various other agents are not recommended for combat-related PTSD pharmacotherapy. Thus, the etiology of the development of PTSD should be explored by those caring for these individuals.

caring for these individuals.

Table 4.5

Level of Evidence for the Use of Medications in Combat-Related Stress

Quality of evidence*	Recommend for	Suggest for	Suggest against	Recommend against	No recommendation for or against
Moderate	Sertraline^		Prazosin (excluding the treatment of PTSD-associated nightmares)		Prazosin for the treatment of PTSD-associated nightmares
	Paroxetine^				
	Fluoxetine				
	Venlafaxine				
Low		Nefazodone‡	Quetiapine	Divalproex	Eszopiclone
			Olanzapine	Tiagabine	
			Citalopram	Guanfacine	
			Amitriptyline		
Very low		Imipramine	Lamotrigine	Risperidone	Bupropion
		Phenelzine‡	Topiramate	Benzodiazepines	Desipramine
				D-cycloserine	D-serine
				Hydrocortisone	Escitalopram
				Ketamine	Mirtazapine
No data†					Antidepressants
					Doxepin
					Duloxetine‡
					Desvenlafaxine
					Fluvoxamine‡
					Levomilnacipran
					Nortriptyline
					Razodone
					Vilazodone
					Vortioxetine
					Anxiolytic/ Hypnotics
					Buspirone‡
					Cyproheptadine
					Hydroxyzine
					Zaleplon
					Zolpidem

*The Work Group determined there was no high-quality evidence regarding medication monotherapy.
^FDA approved for PTSD.
‡Serious potential toxicity, should be managed carefully.
†No data were captured in the evidence review (based on the criteria in Conducting the Systematic Review) and were not considered in development of this table.
‡Studies of these drugs did not meet the inclusion criteria for the systematic evidence review due to poor quality.
Source: Adapted from Department of Veteran Affairs, Department of Defense. (2017, June). *VA/DoD clinical practice guideline for the management of posttraumatic stress disorder and acute stress disorder*). https://www.healthquality.va.gov/guidelines/MH/ptsd/VADoDPTSDCPGFinal012418.pdf

Treatment With Medical Marijuana

A number of state governments have legalized the use of cannabis for medicinal use in the

A number of state governments have legalized the use of cannabis for medicinal use in the forms of edibles, oils, or inhalation. Despite legalization of cannabis in various states, it is still considered illegal by federal law.

Cannabinoids contain two active chemicals in varying concentrations. These are tetrahydrocannabidiol (THC), which is the primary psychoactive chemical, and cannabidiol (CBD), which has no psychoactive properties and may mitigate some adverse effects of THC stimulation. Within the neuronal synapses of various areas of the brain, cannabinoid type 1 (CB-1) receptors exist which are stimulated by a naturally occurring transmitter called anandamide. Cannabinoids work similarly to anandamide but with more potency at the CB-1 receptor. Activating the CB-1 receptors in the amygdala can potentially decrease troublesome memories, fear, and anxiety. Stimulation of CB-1 receptors in the prefrontal cortex can increase serotonin and potentially produce antidepressant properties. Neuronal maturation, improved mood and memory, and a decrease in core PTSD symptoms with a normalization of cortisol may be seen when CB-1 receptors are agonized in the hippocampus. By stimulating the limbic system, there may be a decrease in amygdala and hypothalamus activity. This could assist in regulating the hypothalamic-pituitary axis and cortisol and, therefore, decrease hypervigilance and hyperarousal (Passie et al., 2012).

Despite the theoretical improvements suggested from the use of THC and CBD, analysis of study findings have shown equivocal results. In a recent literature review of medical marijuana use for PTSD treatment (Shishko et al., 2018), the benefits of medical marijuana (MM) were questionable due to severe limitations within the analyzed studies. The majority of evidence was found in anecdotal reports, case studies, or retrospective studies limited by design issues or sample size. One of the larger reviewed studies showed statistically insignificant improvements in PTSD symptoms while the largest reviewed study showed worsening PTSD symptoms following initiation of MM with improvements following discontinuation. The authors concluded that the low level of evidence, coupled with concerns regarding decrease in psychomotor activity and response, short-term memory, motivation, and ability to learn new concepts, results in low level of evidence for recommending MM in PTSD.

Another systematic review of the use of MM in PTSD was undertaken by the Department of Veterans Affairs (Kansagara et al., 2017). Findings were similar insofar as the low level of evidence for benefits of MM in PTSD. The authors also warn that cannabis use is associated with an increased risk of short-term adverse effects; however, data on its effects on long-term physical health vary. MM use is associated with cognitive impairment in active users and potentially serious mental health adverse effects such as psychotic symptoms, though the absolute risk and application specifically to PTSD populations are uncertain. The authors concluded that there is virtually no conclusive information about the benefits of MM in PTSD and limited information on harms, so methodologically strong research in almost any area of inquiry is likely to add to the strength of evidence.

Off-Label Treatment; Ketamine

The ABP theory of PTSD development has led to some clinical trials of the use of intravenous (IV) ketamine infusions for treatment. Ketamine activity occurs at the N-methyl-D-aspartate-type glutamate (NMDA) receptor as an antagonist. The glial cells release NMDA into the synapse; thus, ketamine decreases the effect of NMDA (Rasmussen, 2015). Small clinical trials of ketamine IV have shown rapid reversal of PTSD symptoms in those with chronic PTSD (Feder et al., 2014) as well as in chronic PTSD with comorbid depression (Albott et al., 2018). Despite early positive results with IV ketamine, there are concerns regarding dissociative adverse reactions. The FDA has recently approved an intranasal formulation of esketamine for the treatment of treatment-resistant depression and further larger clinical trials are currently underway for IV ketamine in PTSD with comorbid depression. Therefore, new data will be emerging in regard to the use of these NMDA antagonists in PTSD.

Drug Therapy Duration

Where pharmacological treatment is indicated, clients who are receiving medications for the treatment of PTSD should be continued on medication for varying lengths of time, based on the severity of symptoms and onset of the illness following psychological insult. A client diagnosed with acute onset of the disorder (symptoms present in more than 1 month but less than 3 months) should be continued on drug therapy for 6 to 12 months, at which time a slow downward titration off of the medication should be attempted. In clients who experience chronic trauma symptoms (greater than 3 months), medications should be continued for at least 1 year. If the client experiences adequate response or resolution of symptoms, medications should be continued for 1 to 2 years. At that time, the medication(s) may be slowly decreased in dose until the medication(s) can be safely discontinued. In cases wherein clients are experiencing residual symptoms following optimization of drug therapies, medications may continue for 24 months or longer.

In some clients, medications may be warranted indefinitely based on factors determined by the severity of the condition or social stressors. Such factors as lack of social support, "suicidal ideation," co-occurring mental health diagnosis, propensity for aggression or violence, and poor client function may indicate the need for long-term treatment with pharmacotherapy. Some clients may require medications throughout their lifetime.

Post Medication Recovery

Pharmacotherapy that is used for acute or chronic trauma symptoms is an important treatment for the survivor of trauma by restoring physiological, andneurochemical balance. In cases wherein medications may be decreased slowly or discontinued, it is important for clients to continue with currently prescribed psychotherapeutic modalities. Adherence with these types of treatments can aid clients in coping with symptoms and developing new approaches to management of stress. Insight into the symptoms of their condition is important for clients to develop in order to recognize reemergence of intrusive symptoms, which can cause relapse into the disorder. In such cases of worsening symptoms, clients should be restarted on pharmacotherapy, beginning with the medication or combination of medications that were useful in the prior episode.

Experimental Treatment; Vagal Nerve Stimulation

Newer research has been performed on the use of vagal nerve stimulation (VNS) as a potentially beneficial treatment for PTSD. The vagus nerve, which is the 10th cranial nerve, is implicated in extinguishment of fear response in numerous animal models. The vagus nerve innervates peripheral organ systems and its actions are mixed. Efferent signaling is accounted for by 20% of its transmission whereas 80% of transmission is afferent (Noble, Meruva, et al., 2019). VNS was approved in the United States in 1997 for the treatment of medication-resistant seizure disorders. In seizure disorders, stimulation of both right and left vagus nerves was used; however, stimulation of the right vagus nerve leads to potential slowing of heart rate through extinguishment of peripheral stimulation (Ben-Menachem, 2001). Therefore, VNS in PTSD is focused upon the left vagus nerve, producing extinguishment of peripheral "fight or flight" response. The role of the vagus nerve in this stress/arousal pathway and the specificity of electrical stimulation allow VNS to facilitate memory consolidation and synaptic plasticity (Peña et al., 2013).

The majority of research performed in VNS thus far has been in animal models utilizing rats (Noble, Meruva, et al., 2019). There has been a small pilot study (George et al., 2008) which has shown potential benefit in humans along with some ongoing clinical trials (Clinicaltrials.gov). A review has also suggested that left VNS may be helpful when combined with exposure-based therapies (Noble, Souza, et al., 2019).

COUNSELING IMPLICATIONS

It is important for each and every professional involved in the care of the PTSD client to be cognizant of any changes, both mentally and physically, that occur. Treatment of clients

cognizant of any changes, both mentally and physically, that occur. Treatment of clients involves many disciplines, and optimal care for those afflicted with the disorder requires an integrated approach to care. Because of regular interactions, counselors are well positioned to observe the client for improvement in core symptoms of the disorder as well as the emergence of side effects. Clients who present with untoward, intolerable side effects such as worsening anxiety, nausea, headache, uncontrolled movements, dizziness, or drowsiness can be referred to their physician for evaluation of the client. Therefore, the accessibility of the counselor, coupled with the therapeutic alliances built with them, provide a perfect "clearing house" for improvements in psychological symptoms, while avoiding side effects or adverse drug reactions that may cause clients to become nonadherent with treatment. This is not to say that counselors are responsible for all clinical aspects of care. Healthcare-aware professionals need to be cognizant of the emergence of psychological symptoms of the disorder and to refer the client to the appropriate member of the care team. Optimal care of the client who presents with physical and mental symptoms cannot be performed in "silos" with little interaction among all professionals involved in treatment. Integrated care between healthcare and mental health professionals provides an all-encompassing, gestalt approach to care so that all aspects of the client's care are well managed.

CONCLUSION

Therapists who care for clients suffering from trauma-related disorders should be keenly aware that this subset of anxiety disorders has both psychological and physiological components, each of which requires optimal treatment. A thorough understanding of the pathology, both physical and mental, provides the groundwork for care and outcomes in the afflicted. Recognition of the client's needs and core symptoms is paramount to provision of favorable therapies, but it is not enough. Understanding how and when to intervene on these needs and symptoms provides clients with meaningful ways of living with and coping with PTSD. Integrating psychotherapy and pharmacotherapy allows the person to alleviate the intrusive core symptoms of the disorder while simultaneously developing coping strategies for improved quality of life. Using both methods, recovery from PTSD can be a distinct reality. Please see Box 4.1 to integrate your knowledge of the medications into the development of an initial pharmacotherapy regimen for a client case.

BOX 4.1

Clinical Vignette

A 32-year-old female client presents to the clinic today exhibiting fearfulness and anxiety. She is well known to the clinic staff. About 2 months ago, the client was physically and sexually assaulted in the side parking lot near her local grocery store. The client was treated by the clinic's physician following the assault, and she was referred to a local therapist. She has been attending therapy sessions on a regular basis. Recently, the client complains of difficulty sleeping, with frequent awakenings during the night caused by nightmares. She states that she also drives an extra seven miles to purchase her groceries, stating that she "does not even want to see the place." All laboratory testing and imaging are within normal limits, and her presentation is not consistent with intoxication, infection, or metabolic abnormalities. After assessment, her physician diagnoses her with PTSD.

What would be an appropriate choice for first-line pharmacotherapy?

Answer: An SSRI agent would be initial pharmacotherapy. Because the trauma is associated with an attack in a civilian environment, these agents are considered first-line pharmacotherapy. Of the available agents, both FDA approved and off-label, sertraline has been shown to provide both short-term and long-term benefit. Side note: Because this is a woman of childbearing age, we would want to avoid paroxetine. It is considered a pregnancy category "D" agent, which means that there is higher risk than benefit in using

pregnancy category "D" agent, which means that there is higher risk than benefit in using the agent during pregnancy. Paroxetine has been implicated in the development of cardiac abnormalities in fetuses of pregnant women at a higher rate than other antidepressants. If this young woman would happen to become pregnant, we would have to change her therapy. In order to avoid this, sertraline would be chosen, as it is a category "C" agent (physician should weigh risk versus benefit—all other SSRIs are category "C" as well) and may be a safer choice for PTSD management. Therefore, clinical choices must include prevention of any future issues that may occur in an individual client.

If further treatment is necessary, the client may be prescribed an atypical antipsychotic such as risperidone, quetiapine, or olanzapine. Of these, risperidone may cause the least amount of weight gain and be helpful for the re-experiencing symptoms of the disorder.

Lastly, an agent such as the antihypertensive agent prazosin may be helpful at bedtime to decrease sympathetic outflow and help in normalizing frequent nighttime awakenings and nightmares.

ADDITIONAL RESOURCES

A robust set of instructor resources designed to supplement this text is available. Qualifying instructors may request access by emailing textbook@springerpub.com.