

Course 5K - Sponsored Online by CEU By Net

Chapters 1-4 of An ATTC-SAMHSA Publication



Finding Balance After the War Zone - Part 1

Considerations in the Treatment of Post-Deployment Stress Effects

CEU By Net - Course 5K

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Human Priorities



This is Study Guide 1 of Course 5K

This Online Sponsored Course 5K is an excerpt from a much larger Federally published document. This course begins with Chapter 1 and ends with Chapter 4 from the Table of Contents below. The course is broken up into two Study Guides, and each Study Guide has a quiz.

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Finding Balance **Part 1 - CEU By Net Course 5K**

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Finding Balance

Chapter 1. Clinical Considerations

Trauma resolved is a great gift, returning us to the natural world of ebb and flow, harmony, love, and compassion. Having spent the last twenty-five years working with people who have been traumatized in almost every conceivable fashion, I believe that we humans have the innate capacity to heal not only ourselves, but our world, from the debilitating effects of trauma.

—Peter Levine (*Walking the Tiger: Healing Trauma*, p. 21)

This Guide tells the story of a significant human strength, our natural, automatic stress and survival system. It is a strength that can save lives, but in so doing can lose its balance and become a source of great suffering. Another essential story is that of recovery—the return to balance and the transformation of human lives—and the role that caring, skilled, and knowledgeable people can play in that transformation.

As our communities welcome the return of veterans from Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF, the war in Afghanistan), service systems for substance use disorders (SUD), mental health, homelessness, criminal justice, and other challenges are seeing increasing numbers of returning veterans. In these kinds of insurgency conflicts, exposure to attack is not limited to combat troops, and the sophistication of our military health care system allows many to survive who would have perished in earlier wars (Hoge et al., 2008). There is simply a broader field for war-zone stress injuries to take root.

Evidence also indicates that only a little more than half of the OIF/OEF Service Members and veterans who meet the criteria for posttraumatic stress disorder (PTSD) or major depression have sought help from physicians or mental health providers in the past year, and that roughly the same proportion of people with TBI have been evaluated

for these injuries. And of those who have sought medical care for PTSD, TBI, or depression, only a little more than half have received “minimally adequate treatment” (Tanielian and Jaycox, 2008, p. xxii).

The United States Department of Defense (DoD) and Department of Veterans Affairs (VA) have responded to these service gaps by implementing expanded programs, increasing their service capacity—both at home and in the theater of war—and initiating training in evidence-based practices, but it has become clear that community-based services are needed as well (Tanielian and Jaycox, 2008). In response, the Substance Abuse and Mental Health Services Administration (SAMHSA) has mobilized to help prepare the civilian treatment workforce.

This document is part of that preparation process. Although it is written primarily to address the needs of the Substance Use Disorder (SUD) field, it contains information that may be useful to clinicians in a number of helping professions.

The Role of the **Substance Use Disorder (SUD)** Treatment and Recovery Field

We do not yet know how many veterans with post-combat stress effects will seek substance use disorder (SUD) treatment through CIVILIAN rather than military systems in the months to come. We do know that some VA centers already have waiting lists, and that significant numbers of veterans may be avoiding treatment for fear of the stigma associated with post-deployment stress effects (Tanielian and Jaycox, 2008).

We know even less about the extent of the challenges that the civilian SUD field will face as veterans begin to return in high numbers from Iraq and Afghanistan, and about the long-term demands on civilian treatment systems.

In general, though, the connection between post-trauma effects and substance use disorders is well known to the treatment field. For example:

- Between one third and one half of people seeking treatment for SUDs may also have posttraumatic stress disorder.
- Drug dependence is frequent in war veterans with posttraumatic stress disorder (Alcoholism: Clinical & Experimental Research, 2008)

One preliminary study of Department of Defense prevalence surveys shows that “this generation of veterans has been MUCH CLOSER TO TRAUMA, has completed or may complete multiple tours of duty, and has experienced a GREATER PREVALENCE OF MENTAL HEALTH ISSUES (40%) and of those upwards of 60% also have an SUD” (Danforth, 2007, p. 11). And our experience with Vietnam veterans has revealed that significant long-term problems can follow the stress of war, including chronic substance use disorders and a host of complicating factors (Kulka et al., 1990; Schnurr et al., 2003).

The ROLE of the substance use disorder (SUD) treatment field in MOBILIZING TO MEET THESE CHALLENGES is essential, for several reasons:

- When the human stress system responds to intense or unrelenting stress or threat, it often creates chemical imbalances that people instinctively seek to remedy with alcohol, street drugs, or misuse of prescription medications. The risk of abuse and dependence rises.
- Many of the other aftereffects of war—from the neurological effects of trauma to the psychological and spiritual effects of exposure to death and destruction—can be very painful. Veterans who are hesitant to seek professional services for these effects may be drawn to self-medication through alcohol or other drugs.
- If the alcohol and drugs that have “medicated” combat stress effects leave the system, unconscious stored memories and other symptoms of trauma begin to emerge at higher levels of intensity.
- Injured veterans with pain-management needs are often prescribed opioid pain relievers. Even in the absence of combat stress effects or prior histories of substance use problems, their injuries can leave them more vulnerable to dependence on those medicines.
- Young male veterans with traumatic injuries may be more vulnerable to a number of risk-taking behaviors, including the misuse of alcohol, and less likely to seek or accept help (Good et al., 2008).
- Veterans who are successful at hiding or rationalizing their post-trauma effects may be less successful at hiding the effects of their self-medication with alcohol and other drugs and the dependence that often follows. OIF/OEF veterans have begun seeking services from civilian SUD treatment facilities, and their numbers may rise significantly in the years to come. In some cases, SUD clinicians and recovery support staff may be the only sources of help they encounter.

The standard of care for CO-OCCURRING SUDs and POST-TRAUMA EFFECTS is simultaneous, co-located treatment of BOTH illnesses. In a recovery-based, trauma-informed model of care, SUD clinicians both refer to and coordinate closely with mental health and trauma specialists (White, 2006).

That model has not always been possible, but even where it does exist, it will not succeed unless SUD clinicians and recovery support service providers also receive all APPROPRIATE TRAINING IN THE FOLLOWING:

- The nature of trauma
- The circumstances under which trauma has occurred
- The needs and realities of the individuals who have experienced it
- Any issues specific to clients' CULTURES — including the MILITARY CULTURE.

The effects of trauma reach throughout the human being. As the SUD field has learned in its work with survivors of childhood abuse, a failure to understand and respect the complexities of trauma can derail the treatment process and drive the trauma deeper into the human body, mind, and spirit (White, 1998). An understanding of trauma can elevate the safety and effectiveness of SUD treatment and make ongoing recovery far more likely, and far more complete.

Overview of Clinical Challenges

The Stress of War: Many men and women who have served in Iraq and Afghanistan have spent a long time in a very hard part of the world, surrounded by:

- Constant stress
- Blinding heat
- Sudden and violent attacks
- The loss of people they love and respect
- The sights and sounds of injury and death
- The need to make split-second decisions that might have lifelong consequences

The physical and neurological stress and survival systems that have kept them alert and alive WERE NEVER MEANT TO STAY IN HIGH GEAR for days, weeks, or months at a time. Our species was designed for SHORT-TERM exposure to stress and threat, followed by periods of rest that would let our stress systems return to balance.

POST-DEPLOYMENT STRESS EFFECTS live on a long continuum:

- From acute stress symptoms to chronic posttraumatic stress disorder (PTSD)
- From a mild loss of energy to major depression
- From trouble at work to unemployment
- From a few problems at home to divorce or domestic violence
- From blowing off steam to serious problems with the law
- From a few drinking binges to a fifth-a-day habit

Even strong, brave, intelligent Service Members can bring home significant burdens. For many, their post-deployment STRESS INJURIES are triggered or compounded by the TRAUMATIC BRAIN INJURIES (TBI) that have been declared the “signature” wounds of these wars (Emmons, 2006).

As if these complexities were not enough, there is also the fact that the physical changes are taking place in human beings who have belief systems, thoughts, feelings, spirits, and relationships. While their bodies are responding to threat in powerful, primitive ways, people are also coping on many higher levels—and their physiological stress responses are adding intensity to the impact throughout the whole human being.

This new “generation” of veterans also returns home to a nation in which many veterans of the last large conflict, the Vietnam War, still need help for the stress-related wounds of that conflict, including significant levels of substance use disorders (Kulka et al., 1990; Schnurr et al., 2003).

Our ways of welcoming the new veterans home are infinitely better than the devastating homecoming that many Vietnam veterans received (Shay, 1994). But our collective understanding of the military culture, the experience of war, and the true and full nature of post-deployment stress effects still does not do justice to the extreme sacrifice that so many have made, and so many are still making.

Stigma and Reluctance to Seek Help

Service Members and veterans face an array of post-deployment stress-related challenges. Without an understanding of the physical/neurological roots of these challenges, Service Members and veterans can easily see their symptoms as defects,

signs of weakness, or “emotional problems.” Shame, stigma, and fear of jeopardizing their careers can keep people from seeking help, while small problems grow into big ones (Scaer et al., 2008). The stigma connected to substance use disorders is even more potent, and adds an extra level of shame and reluctance to seek help (Woll, 2005).

For many veterans who seek services in the community, fear of being stigmatized and having “mental health problems” or “substance abuse” attached to their service records may contribute to their decision to stay outside of all structures even remotely connected with the military. Experts at all levels—from the Department of Defense to the individuals seeking to heal the effects of these wounds—agree that shame, self-stigma, and fear of military stigma are significant blocks to help-seeking and recovery.

In the words of one soldier, “Asking for mental health services was like saying ‘I just could not cut it’” (Hutchinson and Banks-Williams, 2006, p. 67). The most common barrier to treatment cited by Service Members is a fear that treatment will not be kept confidential, threatening future job assignments and military career advancement (Tanielian and Jaycox, 2008).

Military leaders have taken important steps to eliminate this stigma within the military culture (e.g., primary care screening programs, training and information campaigns) and to protect the privacy of Service Members who seek help (e.g., the May, 2008 policy that Service Members who apply for security clearances no longer have to disclose any service-related mental health treatment they might have received). But stigmatizing attitudes in a huge and deeply rooted culture are very slow to change, particularly when that culture is surrounded by a larger culture that shares the same attitudes.

Many Service Members, veterans, and their families have been told that acute stress reactions, PTSD, substance use disorders, depression, and other combat stress effects are normal, natural, and nothing to be ashamed of. However, many simply do not believe it (Lighthall, 2008). Human understanding of the effects of trauma is too new, and traditional misconceptions carry too much momentum. Because these conditions have emotional and behavioral symptoms, most people tend to think of them as emotional or behavioral problems, despite their deep roots in our nerves, muscles, and brain chemistry.

Helping professionals can help heal the stigma by communicating that, in the words of Army Col. (Dr.) Tom Burke, “No one comes back unchanged” (Sample, 2004), and that post-deployment stress effects have their roots in natural stress and survival systems.

One of the strongest antidotes to self-stigma is an understanding of the specific ways in which stress and threat can affect physical and neurological survival systems—provided these effects are described in measured, matter-of-fact terms that:

- Emphasize strengths, capabilities, and resources
- Affirm that these are normal physical reactions to abnormal stress
- Use neutral and inclusive terms like “post-deployment stress effects” and “substance use disorders” rather than the more stigmatized “mental problems,” “substance abuse,” or even “PTSD”
- Do not “pathologize” people with post-deployment stress effects, including SUDs, or imply that they are somehow helpless, “defective,” or dangerous
- Do not portray the stress-affected or addiction-affected brain or stress system as defective or “diseased”
- Confirm that people can and do recover from many symptoms of combat stress and learn to manage any remaining symptoms
- Confirm that people can and do recover from substance use disorders

The Need for Service Member- or Veteran-Specific Education and Training

One effect of having an all-volunteer military force has been the separation of many Americans from contact with Service Members and the military culture. When media coverage of the wars in Iraq and Afghanistan runs at low ebb, civilians also tend to lose track of information about conditions at war and see few reminders that the war is still in progress.

Although the nation as a whole is welcoming this generation of veterans home in a manner that acknowledges their service and their sacrifice, we tend to lag behind in our education about the realities of Service Members’ and veterans’ lives and experiences. Even families of Service Members are sometimes unprepared for the new people their loved ones have become, and for the new dimensions of their experience (Armstrong, Best, and Domenici, 2006; Henderson, 2006; Lighthall, 2008).

Clinicians in the fields of substance use disorder (SUD) treatment, mental health, and other helping fields are no exception. Those without experience or expertise in post-deployment stress effects, or in the military culture and experience, can bring unintended harm through well intended words, actions, and treatment practices. The well prepared clinician will have sought and received information and training in:

- The neurobiology of stress, resilience, and vulnerability to trauma
- The relationship between trauma and substance use disorders
- Developmental factors that affect resilience and vulnerability
- Military factors that affect resilience and vulnerability
- The experiences of Service Members in Iraq and Afghanistan
- The range of post-deployment stress effects

- Considerations for safety and respect in treating veterans
- Considerations in assessment
- Considerations in treatment planning
- Matching evidence-based and promising practices to symptom clusters
- Helping veterans find meaning and purpose in their experiences
- Providing help for the family
- Recovery and self-care

Civilian providers understand the need to tailor their services to veterans' needs, but many lack more specific information. Even those who are well schooled in trauma, depression, and SUDs may still need knowledge and training on the military culture, veterans' experiences, ways of earning veterans' trust, safe vs. unsafe treatment approaches, the effects of traumatic brain injuries (TBI) on treatment needs, and ways of balancing the pain-management needs of injured veterans with existing or potential dependence on opioid medications.

An added and important benefit of learning more about OIF/OEF veterans' post-deployment stress effects will be increased effectiveness of services to Vietnam-era veterans whose chronic SUDs and other post-combat effects still bring them into civilian treatment systems. When these veterans returned from war, our nation knew very little about post-deployment stress effects and the importance of welcoming veterans home and honoring their service. We can never right that wrong, but we can do our small part to make things better now.

- Educate veterans and families about the neurobiology of resilience, stress, trauma, post-deployment stress effects, substance use disorders, and recovery
- Train veterans in skills that will help them manage their stress systems and successfully negotiate their experiences and relationships
- Train family members in skills that will help them manage their own stress responses and support their loved ones' recovery processes

As returning veterans and their families learn about the development of body's stress and survival responses, it is important that they learn and remember that:

- The body's response to stress and threat is automatic and natural; it is not a matter of choice, and it is not a matter of character.
- People with PTSD and/or substance use disorders are not "going crazy." These are physical conditions with many remedies.

- We are much more than our stress systems. Just as body, mind, spirit, and relationships are all affected by post-deployment effects, so can—and do—resources in all these areas of life contribute to the healing process.
- People really do recover from, and learn to manage, post-deployment stress effects and substance use disorders.

Effective Treatment Responses

No one knows exactly when the bulk of the troops will come home from Iraq or Afghanistan, or how rapidly the level of need will increase, but one thing is certain: Given the many sacrifices they have made, all veterans deserve the best, safest, most appropriate, most seamless care and support that our communities and service systems can provide.

It is not enough to offer SUD or mental health “treatment as usual,” and great care will be needed to avoid iatrogenic effects (harm caused by the treatment or the treatment provider). For example, former Army Psychiatric Nurse Alison Lighthall warns that:

- **Group therapy with general client populations can set the scene for well intended but devastating questions or comments by civilian group members.**
- **Psychotherapeutic techniques that fail to lay a firm groundwork for stability - or that probe traumatic wounds for signs of underlying pathology - can destabilize veterans and bring on new wounds and crises.**

Instead, appropriate responses to the needs of returning veterans will include:

- A strength- and recovery-based focus
- An empowering, skill-training approach
- Careful, individualized, respectful, veteran-specific assessment and treatment planning
- A primary emphasis on stabilization and development of internal and external resources
- Education for veterans and families on the physical aspects of trauma and substance use disorders, as a method of empowerment and a way of destigmatizing these effects
- Assertive linkage to ongoing support within the community—and in the larger military and veteran community nationwide

As services for returning veterans and their families evolve, significant input from veterans and family members will be needed to ensure that these services are

accessible, respectful, culturally competent, consumer-driven, and effective for this population. These conversations are taking place on a national level and in many regions and states. But it is also the responsibility of individual service systems and treatment organizations to ensure that veterans and families play an active role in shaping local responses to their needs.

Clinicians need to:

- Understand on deeper levels our human survival systems, the effects of war-zone stress on these systems, and the reality of recovery and return to balance
- Communicate with veterans and their families about these matters in strength-based and normalizing terms that remove the stigma and shame from their experiences, their reactions, and their willingness to accept help
- Organize SUD and mental health treatment and recovery responses around the state of the science, knowledge of the military culture, the wisdom and experience of those who have made progress in regaining balance, and the goals and choices of individual veterans and family members
- Offer veterans treatment approaches that are tailored to their symptoms and disorders and have the smallest possible chance of triggering iatrogenic effects.
- Maintain an openness and curiosity about the individual veteran and his or her experiences and realities
- Understand their own experience of trauma, and maintain stability in the conscious process of addressing and resolving any issues attached to that realm of experience
- Keep any agendas they might have about the war or the veteran's participation in it (e.g., feelings or opinions about the war in Iraq, political issues) completely separate from the therapeutic process

Treatment organizations need to:

- Educate staff at all levels on the military culture, the circumstances of returning veterans, the nature of post-deployment stress effects, and the nature of substance use disorders
- Have a plan in place to ensure that all staff treat returning veterans as welcome and valued customers
- Listen to recovering veterans and their families, and understand that they are the experts on their own feelings, symptoms, and treatment goals
- Help them understand their post-deployment effects, including substance-related symptoms, in terms of their automatic physical stress and survival systems, and the natural reactions of those systems to circumstances in the theatre of war
- Show veterans and their families the strengths that exist within them in spite of their symptoms, and the transformative power of the recovery process

- Give veterans and their families meaningful opportunities to influence the development and improvement of services for this population

Characteristics of Effective Treatment Responses

Effective responses to the needs of veterans with post-employment stress effects include a consistent approach that:

- Integrates trauma-informed SUD and mental health care
- Maintains and supports a strength-based, recovery-based, consumer-centered, culturally competent, veteran-competent, and safe approach toward treatment
- Begins with knowledge of the military culture and Service Members' experience
- Respects each veteran's right to set goals and choose treatment approaches
- Makes full accommodation for the range of injuries and disabilities, including learning assistance for people whose head injuries have caused cognitive challenges

Staff have mastered the key areas of knowledge and understanding necessary to help veterans return to balance, including:

- The nature of human resiliency and vulnerability to stress, trauma, and substance use disorders
- The neurobiology and physiology of stress, trauma, embodied stress, return to balance, and management of post-deployment stress effects and substance use disorders
- The many levels of human experience that are affected by trauma and involved in the return to balance, and the range of biological, cognitive, emotional, spiritual, and social processes that an individual veteran may need to address
- The difference between acute stress disorder, transient post-deployment stress symptoms, acute PTSD, and chronic PTSD, and the many relationships between these effects and SUDs
- The relationship between trauma and the range of disorders of extreme stress sometimes diagnosed as personality disorders, and the relationships between these effects and substance use disorders
- The effects of TBI learning, emotions, and substance use, and their implications for treatment
- The stages of trauma recovery and appropriate measures at each stage
- The purpose, protocols, and appropriate audiences for the treatment approaches they use
- Their own reasons for wanting to do this work, and any "agendas" they might have
- Self-care measures for those who work with traumatized consumers

Individualized, strength-based, consumer-driven, trauma-informed, and evidence-based assessment and treatment/recovery planning:

- Assesses and builds on the individual's strengths and resources
- Uses respectful assessment tools that match veterans' experience and needs
- Matches safe, appropriate evidence-based and promising practices to the individual veteran's goals, challenges, needs, and circumstances
- Allows the individual veteran to choose among appropriate treatment approaches
- Refers veterans readily to other providers when needed services are not available on site
- Acknowledges and coordinates multidisciplinary treatment and case management for the range of injuries, disorders, and challenges that an individual might have
- Includes the family in the treatment process and provides services (and linkage to services) for family members, including children

The provider's recovery support focus:

- Builds on the SAMHSA-supported national efforts toward recovery-based services
- Assertively links Service Members, veterans, and families with ongoing national, community-based, and veteran/family-specific support structures

Finding Balance



Chapter 2. Resilience and Vulnerability to Traumatic Stress

Every human being has had the experience of powerlessness, and of his or her absolute dependence on beings much larger and more powerful. This is universal and momentous.

—Jonathan Shay, MD, PhD (*Odysseus in America*, p. 248)

This chapter looks at the human stress and survival system:

- How the body naturally responds to stress and threat
- How we first develop our ability to respond to stress in balanced ways
- How our stress systems become more vulnerable to being put off balance and overreacting to stress

Later sections will show how some of these vulnerabilities can leave us open to substance use disorders, post-trauma effects, depression, and anxiety—and how resilience can help us recover.

The concept of resilience—the ability of human beings to “bounce back” and rise above their circumstances—is a source of great hope and wonder. It helps us understand the fact that so many people have survived and succeeded in spite of adversity, yet it always remains a little mysterious. Far less mysterious is the fact that some painful life experiences and circumstances can raise our vulnerability to illness and social challenges.

When we speak of vulnerability to trauma, substance use disorders, and other challenges, we must always remember resiliency. The fact that people develop post-deployment stress effects and SUDs does not mean the same people are not also strong and resilient in many ways. This resilience may have contributed to their survival of these experiences and their effects, and it may tip the scales toward lasting recovery.

Service Members' SUDs and post-deployment stress effects do not begin in childhood. However, in childhood we all have experiences that make us more or less vulnerable to substances and to the effects of stress and threat. We need to understand, not only how the stress and survival system works, but also how it develops, what makes it resilient, and what might have made it more vulnerable.

The enormous stigma directed toward SUDs and post-deployment stress reactions is a direct result of our culture's widespread misunderstanding of the nature of these reactions. Often the best antidote to that stigma—and the only way to back up the claim that “these are normal reactions to abnormal stress”—comes in the form of scientific explanation: “We **know** these are normal reactions because this is how the human stress system works.”

For many returning veterans, an important first step is to learn that the challenges they have attributed to weakness or “going crazy” are instead the very predictable work of some brain structures that have names and shapes and live inside all of us.

War holds many experiences, and the human being naturally responds with many emotions. Human emotions do not cause post-deployment stress effects or substance use disorders, though they are often amplified by these effects. Severe post-trauma reactions might be thought of in many ways, including as the inability of certain higher brain regions to regulate the *amygdala*, the primitive brain structure charged with forming and storing memory associated with emotion—and with keeping us safe and alive (Schoore, 2002).

How We Work Toward Balance

The ideal:
Homeostasis
(Stable Equilibrium)

The compromise:
Allostasis
(Balance Through Change)

How we do that:
The Autonomic Nervous System

<p>Active response to threat:</p> <p><i>The Sympathetic Nervous System</i> (Fight or Flight)</p>	<p>Passive to helplessness:</p> <p><i>The Parasympathetic Nervous System</i> (Rest, reset, numb)</p>
<p>Combination (Freeze)</p>	

To find out how this happens, it helps to look at how the brain and the rest of the body first learn to handle stress and threat. What follows is a very quick and much-simplified overview of some of the major functions involved in resilient responses to stress, and in the development of resilience.

This chapter has five sections and two pull-out pages:

- How the Body Responds to Stress and Threat
- Promoting Resilient Responses
 - Summary of Balance and Resilience
- Developmental Factors that Increase Vulnerability to Post-Trauma Effects
- Common Sources of Stress in Childhood
- Sustaining Stress and Trauma in the Body
 - Summary of Increased Vulnerability

How the Body Responds to Stress and Threat

Balance and Stress: The human body is designed to stay in balance, in spite of all the sources of stress and threat in the world. When we think of balance, we often think of stability or **homeostasis**, a relatively stable state of equilibrium. But even to approach homeostasis, the body often has to rely on **allostasis**—the use of change to achieve stability—much the way one would spread one’s arms and lean from side to side to balance on a narrow board. In general, the lower or more temporary the stress or threat, the easier it is to use allostasis to regulate and balance the body’s reactions (McEwen and Wingfield, 2003).

The **autonomic nervous system**—whose control of heart rate, breathing, metabolism, energy, perspiration, etc. works toward balance—has two “arms” that rise and fall in turn:

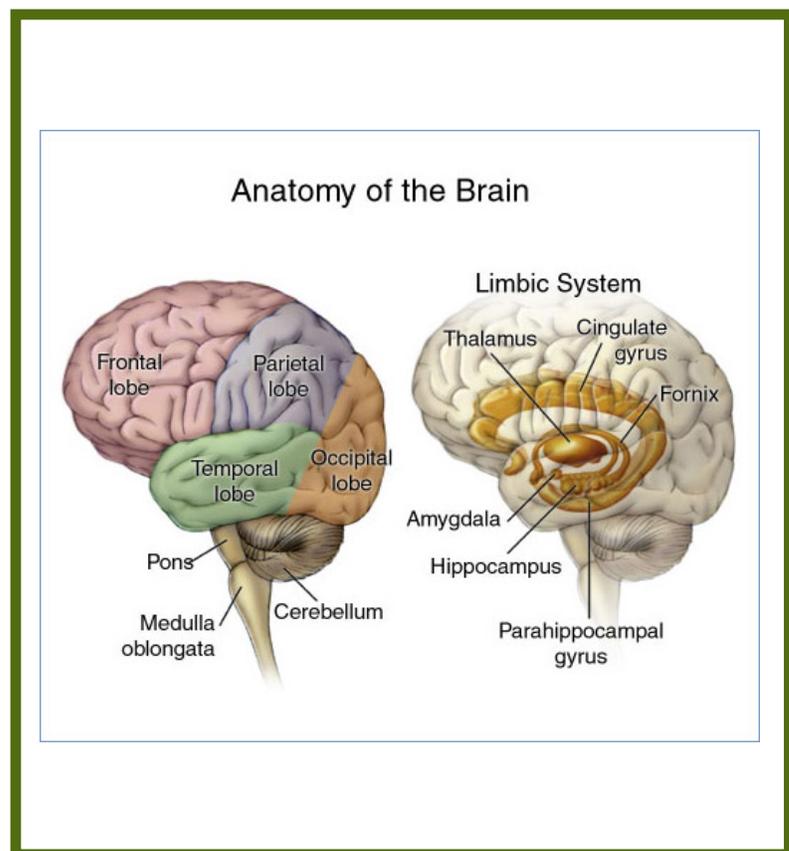
- The **sympathetic** nervous system, the one that speeds up processes (heart rate, breathing, metabolism, energy, etc.) and tightens muscles
- The **parasympathetic** nervous system, the one that slows down these processes and relaxes muscles

The body’s responses to stress and danger tend to fall into these two categories, sympathetic and parasympathetic. They are meant to operate in gentle allostasis, with the sympathetic side rising to fight or flee from temporary threat, and the parasympathetic rising to keep us safe when we are helpless—and to quiet down the sympathetic and return us to homeostasis.

A useful tool for keeping these two terms straight might be to think of the sympathetic nervous system as being “sympathetic” toward our initial need to run from danger, and the parasympathetic as being the opposite and balancing reaction.

Brain Structures That Help Regulate Stress Reactions: It takes the coordinated work of many brain structures, systems, and chemicals to regulate all our stress reactions. These structures live on all levels of the brain, from the very primitive, emotional, “reptilian” **brain stem**; through the more recent **limbic system** or “mammalian brain”; to the higher and most recently developed **cerebral cortex**. And although the brain has two **hemispheres** (each a mirror image of the other), key structures and circuits in the **right hemisphere** are particularly important in responding to stress and threat (Schore, 2001; Siegel, 2001; van der Kolk and Fislser, 1995).

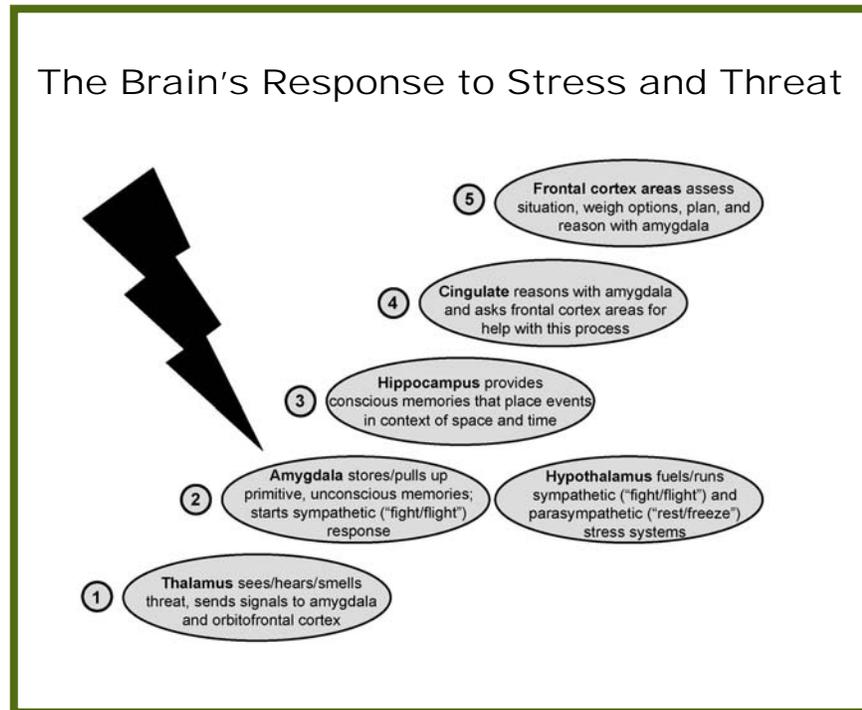
The most powerful player in this drama is the amygdala, a small, almond-shaped structure in the limbic system. Buried deep in the brain, the **amygdala** is an ancient structure designed to keep us alive. It stores unconscious emotional memories and triggers the body’s responses to stress and threat. Under stress, the amygdala contacts the **hypothalamus** (control hub of many of the body’s chemical processes) and sets the autonomic nervous system in motion. Several organs respond by sending out powerful rushes of sympathetic (e.g., **adrenaline, norepinephrine, dopamine**) and parasympathetic (e.g., **cortisol, endorphins, acetylcholine, oxytocin, GABA**) stress chemicals.



Many of these chemicals (particularly adrenaline and norepinephrine) are meant to be used up in vigorous exercise as we take physical action to remove the threat or take care of the source of stress. And one of the brain’s many jobs is to keep these two chemical systems—sympathetic and parasympathetic—in balance. That balance helps keep us “resilient,” able to keep ourselves safe and bounce back after intense experiences (Schore, 2001; Scaer, 2005).

Receiving signals from the **thalamus** (the brain’s relay system) and the **olfactory bulb** (our sense of smell), the amygdala stores unconscious memories that are primitive

fragments—pictures, sounds, scents, feelings. When it receives signals that remind it of past threats—even if these signals are very different from the earlier threats—the amygdala brings up those memories as if they were happening now. Then it sets off all the chemical fight/flight/freeze reactions. Its goal is to keep us alive and functioning (LeDoux, 1996).



Several other, more sophisticated structures are ready to help the primitive amygdala understand what is really happening and decide whether or not to flood our bodies with chemicals—and when to stop. In each case it is the component in the right hemisphere that takes the lead in responding to stress and threat.

- The **hippocampus**, right next to the amygdala, provides conscious, detailed memories that help us remember what has happened in the past and use those memories to understand what is happening now. The hippocampus orients us in time and space—the here and now.
- The **insular cortex**, next to the thalamus, helps us translate our sensory experience into emotions and thoughts about those emotions.
- The **anterior (front) cingulate gyrus**, above the amygdala, is a bridge between attention and emotion. With some help of the insular cortex, the cingulate helps us perceive and understand the world of people, and it is one of the structures that tries to reason with the amygdala. It also asks the nearby orbitofrontal cortex for help when it senses that the amygdala may be overreacting.
- The right **orbitofrontal cortex (OFC)** is an area of the **prefrontal cortex**, the highest, most sophisticated part of the brain, responsible for everything from logic to empathy. Located behind and above the eyes, the OFC helps us assess the threat, weigh all the options and consequences, come up with a plan, and work to calm the amygdala.

The amygdala is a primitive structure, much like a guard dog whose understanding is sketchy but whose mission—our protection—is clear. The amygdala cannot see or hear

subtle differences in the signals it receives from the thalamus, and it lacks the conscious memories that would help it put these signals in context—“Oh, **that’s** what it is!”—and interpret them correctly (LeDoux, 1996). Its memories are unconscious, primitive, and fragmented—Brown and Kulik (1977) called them “flashbulb memories” of sound, image, scent, and emotion. In its zeal to protect us, the amygdala reacts to incoming signals by pulling up whatever memories might be related to these signals. So a gunshot and a champagne cork are all the same to the amygdala.

The orbitofrontal cortex also receives signals from the thalamus, but these are more sophisticated than the ones the amygdala receives, and the OFC is better at decoding them (LeDoux, 1996). So even though it learns of potential threats after the amygdala has set the stress systems in motion, the OFC is still in a good position to provide more information and work toward regulating the amygdala’s ongoing response.

Promoting Resilient Responses

The higher structures that help “talk to” and regulate the amygdala—the hippocampus, insular cortex, cingulate gyrus, and orbitofrontal cortex—are first nurtured and developed during a brain “growth spurt” in infancy (9-12 months through 18-21 months), through:

- Loving touch and bonding with caregivers
- Loving, consistent, responsive face-to-face contact with caregivers, (this is often called “attunement” or “face-to-face attunement”)
- The experience of having our caregivers communicate with us (verbally or non-verbally) in ways that show they notice and understand our needs and feelings (called “contingent communication”) (Siegal, 1999)
- Having our caregivers respond to our stress in soothing ways that teach us how to soothe our own stress and confirm that the world is a fundamentally safe place (Schoore, 2001).

These higher structures develop more fully—and are far better equipped to help the amygdala handle stress—if we have safe, consistent caregiving experiences as babies and children (Schoore, 2001). The orbitofrontal cortex actually learns to send fibers of a chemical called GABA (gamma-aminobutyric acid) down to the amygdala, to soothe it and slow down its reactions to stress (Siegal, 2007).

Summary of Balance and Resilience

What happens in balance and resilience?	
What kind of early nurturing tends to lead to these responses?	Loving caregivers who hold us, gaze into our eyes, and respond appropriately to our needs and feelings tend to foster resilience.
What kinds of life experiences make these responses most likely?	Balance and resilience are most likely to develop when our experiences include short periods of stress or threat followed by periods of calm and rest, so we can return to balance.
How does the autonomic nervous system (ANS) respond?	The two poles of the ANS—sympathetic (fight, flight, arousal) and parasympathetic (rest, dissociation)—are both activated, and they use and obey all the feedback loops that keep them in balance.
Which brain structures are most powerful in these responses?	The orbitofrontal cortex, anterior cingulate cortex, and hippocampus inform and regulate the amygdala, so the other structures (locus coeruleus, hypothalamus, pituitary, vagus nerve, etc.) also behave.
Which chemical messengers carry these responses?	Dopamine, norepinephrine, adrenaline, corticotrophin-releasing hormone (CRH), adrenocorticotrophic hormone (ACTH), cortisol, gamma aminobutyric acid (GABA), acetylcholine (ACh), endorphins, enkephalins, and serotonin keep rising and falling to keep balance.
How do these responses affect heart rate and blood pressure?	Heart rate is strong and variable (rises on inhale, lowers on exhale), and blood pressure is normal.
How about breathing?	Breathing is strong and deep, with a plentiful supply of oxygen.
What effects do these balanced responses have on memory?	We have good access to both explicit (conscious, verbal) and implicit (unconscious, survival-based) memory, and we can clearly tell the difference between the past and the present.
What effects do these balanced responses have on thoughts?	We can think clearly, see all our options, think through the possible consequences, and make reasonable decisions.
What effects do these balanced responses have on feelings?	Pleasant and unpleasant feelings come and go, in response to whatever is happening right now, but we do not have to act on them.
What are the strongest survival impulses?	Our survival impulses are tailored to the level of stress or threat that we are facing at the moment.
What if the stress or threat keeps on coming, or keeps coming back?	Under constant or frequent stress or threat, we tend to go out of balance, unless we can remove ourselves from the stressful or threatening situations in time.

The process of staying in balance under stress is also much easier if the kinds of threats we face during our early years are short lived, temporary, followed by physical activity (to burn off the adrenaline and other stress chemicals), and surrounded by periods of calm and safety. That gives our stress systems time to rest and “reset.”

While our bodies and brain structures are handling stress and threat, so are our minds, emotions, spirits, and ways of relating to others. The processes of attunement and contingent communication may activate **mirror neurons** in the prefrontal cortex that allow us to identify with and imitate the experiences of others (Siegal, 2007). It is also through these processes during this critical growth period that we develop what Janoff-Bulman called the three fundamental core assumptions that allow us to develop a basic sense of trust: “The world is benevolent; The world is meaningful; The self is worthy” (Janoff-Bulman, 1992, p. 6)

And as we continue to develop, our higher brain structures—especially the prefrontal cortex—help us grow in wisdom and maturity, care about others, choose to do the right thing, and figure out what it all means (Siegal, 2007).

Developmental Factors that **INCREASE** Vulnerability to Post-Trauma Effects

The human capacity to adapt is the source of our survival, our well being, and much of our pain. When the world is excessive in the stress it applies, our bodies tend to be excessive in their responses. We survive, but at a price we may keep paying for a long time. This chapter discusses a number of factors that may increase a service member’s vulnerability to substance use disorders, post-deployment stress effects, depression, and anxiety long before he or she enters the military.

Increased Vulnerability in Childhood: Although Service Members’ SUDs and post-deployment stress effects do not begin in childhood, increased vulnerability to trauma in war—or in any other environment—may begin in childhood. An understanding of the biological vulnerability that many people grow up with can bring a better understanding of the vulnerability that many people carry into the theater of war.

As earlier pages showed, the factors that best allow children to develop resilient stress response systems include consistent, “attuned” attachment and caregiving, a chance to burn up stress chemicals (e.g., adrenaline, norepinephrine, dopamine) through physical activity, and a chance to rest and “reset” between short, moderate periods of stress and threat (Schoore, 2001).

But in the real world:

- Most threats cannot be fought effectively with the resources that children possess
- Many threats take place in situations in which children cannot burn off excess stress chemicals with physical activity
- Many stressful or threatening circumstances are long lived, recurrent, or chronic
Many children and adults are faced with multiple stressful or threatening circumstances
- Many caregivers are unable to relate consistently in the ways needed to promote healthy development and regulation of children's stress systems, often because of challenges to their own stress systems

Like the autonomic nervous system, children's responses to extreme or chronic stress or threat also have two "arms":

- A sympathetic arm that leans toward anxiety, hyperactivity, and hyperarousal (the fight-or-flight response)
- A parasympathetic arm that leans toward "shutting down," numbing, and dissociation (compartmentalization of traumatic memory and experience)

When children's experiences do not provide the safety and nurturing they need for development, a number of consequences can follow, to greater or lesser degrees:

- Their sympathetic "fight or flight" chemicals (e.g., adrenaline, noradrenaline, dopamine) may be triggered too easily under stress (Schore, 2002; Perry, 2001). Growing up, they may be more vulnerable to levels of anxiety, and alcohol or drugs may seem like the only convenient "remedy"
- Their parasympathetic "slow down," numbing, "freeze" chemicals (e.g., cortisol and the chemicals used to stimulate its release) may be triggered too easily under stress (Weiss, Longhurst, and Mazure, 1999). In adolescence, they may be drawn to substances that elevate their moods.
- Throughout their lives, anxiety may drive them toward situations that are unsafe (because these situations are familiar, and when we are anxious, we seek that which is familiar) (van der Kolk, 1989).
- Children's bodies may develop patterns of responding to stress with high levels of pleasurable (e.g., dopamine) or numbing (e.g., endorphins) chemicals. When stress subsides, withdrawal from these chemicals can leave them with urges to drink, use drugs, or re-enact stressful situations for their chemical effects (van der Kolk, 1989).

- They may have less of the chemical (serotonin) that helps control moods and impulses—including the impulse to do things compulsively, drink, or use drugs (van der Kolk, 1994).
- Some of these chemical reactions (e.g., having too much cortisol or too little serotonin) may weaken their immune systems and their resistance to illness.
- Children may grow more vulnerable to anxiety disorders and PTSD later in life (Schore, 2002; Perry, 1994).
- They may be more vulnerable to diseases that run in their families, including substance dependence, depression, and other mental illnesses (Heim and Nemeroff, 2001; Schore, 2002; Perry, 1994).
- Because of challenges to their orbitofrontal cortex and hippocampus, they may have difficulty thinking things through and remembering details of things that have happened (Schore, 2002; Perry, 1997).
- Children may have a harder time learning who they are in the world (Schore, 2002; van der Kolk, 1989; Herman, 1992), in part because of the “disconnect” between the amygdala’s powerful, unconscious memory fragments and the conscious context provided by the higher brain structures.

Possible Genetic Factors in Chemical Vulnerability: The SUD treatment field is already well aware of the growing body of literature linking genetic factors with vulnerability to substance dependence (Nestler, 2000; McClung and Nestler, 2003; Comings et al., 1994). Now researchers are also finding genetic factors that may make it more likely that children’s and adults’ bodies will respond to stress and trauma with some of the other chemical excesses and deficits described above. Although much more information will be needed, there is evidence that:

- Challenges to a number of genes that influence the transportation of serotonin (e.g., SERTPR, 5-HTTLPR, SLC6A4) may be involved in making serotonin less available, and so may make people more vulnerable to PTSD, depression, suicidal tendencies, and other psychiatric illnesses (Lee et al., 2005; Zalsman et al., 2006; Barr et al., 2004; Gelernter, Pakstis, and Kidd, 1995).
- Different variations in the stress-related gene FKBP5 may make people more or less vulnerable to severe PTSD symptoms by influencing the availability of cortisol (Binder et al., 2008).
- A variation in the dopamine transporter gene SLC6A3 may make people more vulnerable to developing PTSD by increasing the availability of dopamine in response to stress (Segman et al., 2002).
- A variation in the gene APOE may contribute to more difficult reexperiencing symptoms and memory problems in people exposed to trauma (Freeman et al., 2005).

Common Sources of Stress in Childhood

Although we often tend to think of childhood stress and trauma in terms of abuse by a caregiver or another significant adult, many things can be traumatic or challenge children's developing stress and survival systems, for example:

- Anything that threatens the love and care they need from their caregivers
- The serious illness or death of a close friend or family member
- The presence and effects of substance use disorders in the family, particularly dependence disorders
- Serious illness or medical or dental procedures (including anesthesia, surgery, immobilization)
- Accidental injuries or poisoning
- Experiencing or witnessing violence or conflict in the home or community
- Experiencing or witnessing a car crash
- Natural disasters or terrorism
- Violence or bullying at school
- Racial, cultural, or religious prejudice and/or discrimination
- The effects of poverty and hunger

It is easy to see how some parents who were traumatized in childhood have a hard time developing the skills to impart safety and nurturing to their children, and so “pass” vulnerability from generation to generation. But there is also a growing recognition that cultural trauma—the effects of slavery, genocide, racism, subjugation by another culture, etc.—can be passed from one generation to the next (Eyerman, 2001). For example, Eduardo Duran (2006) wrote of the long-term effects of the now-unimaginable treatment of Native American peoples at the hands of the white settlers and their government. “This concept later became known as intergenerational trauma, historical trauma, and the Native American concept of soul wound. These concepts all present the idea that when trauma is not dealt with in previous generations, it has to be dealt with in subsequent generations...there is a process whereby unresolved trauma becomes more severe each time it is passed on to a subsequent generation” (Duran, 2006, p. 16).

Ways of Mitigating Stress and Trauma: Parents can help children by encouraging them to talk about what has happened, teaching them ways of self-soothing and creating safety, and helping them find meaning in events. This would:

- Activate the higher brain structures (e.g., hippocampus, insular cortex, anterior cingulate gyrus, orbitofrontal cortex)
- Provide conscious memories to put the amygdala's unconscious memories in perspective
- Help them soothe and reason with the amygdala (experts in the field of trauma sometimes call this “talking to the amygdala”)

Summary of Increased Vulnerability

	Sympathetic Reactions	Parasympathetic Reactions
What kinds of early nurturing experiences tend to lead to these reactions?	Inconsistent caregiving, lack of face-to-face attunement with caregivers, lack of safety, abuse or neglect	
What kinds of life experiences make this reaction most likely?	Threat with the possibility of successful defense or escape	Threat with helplessness—no perceived chance of defense or escape
How does the autonomic nervous system (ANS) respond?	Sympathetic nervous system is activated, leads to physical arousal	Parasympathetic nervous system is activated, slows down physical arousal
Which brain structures are most powerful in this survival response?	Basolateral nucleus of amygdala, hippocampus, locus coeruleus	Central nucleus of amygdala, dorsal nucleus of vagus nerve
Which chemical messengers carry this survival response?	Norepinephrine, adrenaline, dopamine	ACh, CRH, ACTH, cortisol, ACh, GABA, endorphins, enkephalin, serotonin
How does this reaction affect heart rate and blood pressure?	Heart rate and blood pressure rise, body heats up	Heart rate and blood pressure fall, body cools
How about breathing?	Rapid, shallow breathing	Slow, shallow breathing
What effects does it have on memory?	Intrusive memories, flashbacks, past “invades” the present (Hypermnnesia)	Loss of memory of the incident, or generalized memory loss (Amnesia)
What effects does it have on thoughts?	Rapid thinking, impulsive decisions	Confusion, trouble thinking or making decisions
What effects does it have on feelings?	High levels of fear, anxiety, excitement, or aggression; wild, unstable emotions	Numbing, depression, grief, hopelessness, feeling paralyzed or “not there”
What are the strongest survival impulses?	Fight and/or run away	Not move, escape inside, tune out, shut down
What if the stress or threat keeps on coming, or keeps coming back?	All these arousal reactions wear themselves out; the body goes into dissociation	These dissociation reactions are overpowered; the body goes into arousal

As noted in an earlier page, the brain also has two halves or **hemispheres**, each a mirror image of the other, but in charge of different functions. Most of our responses to stress and threat take place in the **right hemisphere**. The right hemisphere focuses on our unconscious memories. It is involved in reward, punishment, and emotion, while the left hemisphere focuses more on logic and linear stories (what happened first, what happened next, etc.).

When we try to make sense of our experiences—or tell the story from start to finish—our unconscious, emotional memories can be combined or “integrated” with the left hemisphere’s conscious memories and reasoning processes. It helps the brain put things into perspective and helps the stress systems return to balance (Siegal, 1999).

Unfortunately, many parents and other significant adults in children’s lives have been raised to believe people are better off if they just forget what has happened. Fear and/or loyalty may also keep children from talking about their experiences—or keep adults from listening and helping children work through their reactions. So children’s memories stay trapped in the unconscious amygdala, which continues to trigger frightening images, strong emotions, and powerful stress chemicals and reactions.

Trauma in the Years that Follow: Although the effects of stress and trauma in childhood often have deeper roots, the experience of trauma at any time before military service can also make people more vulnerable to stress when they deploy to the war zone. For example, one large study that included 5,324 OIF/OEF troops found that the experience of having been assaulted before military service doubled the rates of post-combat PTSD symptoms in both women (22 percent rather than 10 percent) and men (12 percent rather than 6 percent)—even though none of the participants had PTSD before deployment (Smith et al., 2008).

Sustaining Stress and Trauma in the Body

The parasympathetic “slow-down” chemicals that numb us or make us “shut down” under stress play important roles in keeping our memory of intense experiences locked in the unconscious amygdala. If that happens, the stored memory can be triggered later and come back as intense feelings, images, and sounds, as if it is all happening now (as it does in flashbacks). This is because:

- **The chemical rush (particularly cortisol and endorphins) has shut down the process of recording conscious memory in the hippocampus.**
- **Norepinephrine has stepped up the amygdala’s recording of unconscious memory fragments (van der Kolk and Fisler, 1995).**

Each time these emotional memory fragments are triggered and reexperienced, we can actually be retraumatized by the memories themselves, even if there is no real threat in the present (Scaer et al., 2008). And the chemicals that carry these signals tend to travel over the same neural pathways in the brain, over and over. This makes it easier for signals of alarm to travel those pathways in the future, through a learning process called long-term potentiation.

In situations in which we are trapped or helpless, the parasympathetic arm of the stress system can send out chemicals (e.g., GABA, acetylcholine) that create a “freeze response.” It does this largely through the work of the **vagus nerve**, a structure deep in the brain stem. The heart rate slows, blood pressure drops, breathing becomes slow and shallow, and energy declines. At the same time, though, all the sympathetic “fight or flight” chemicals are still pumping, so our intense experiences can be stored in our body’s procedural memory system (Scaer, 2005).

This is the same freeze state that animals in the wild enter when their predators are upon them. From a primitive survival standpoint, the freeze is a reasonable response to helplessness, perhaps the most important part of the animal’s survival system (Levine, 1997). In nature, the freeze takes place just before or at the moment the predator catches up with the prey. “The stone-still animal is not pretending to be dead. It has instinctively entered an altered state of consciousness shared by all mammals when death appears imminent” (Levine, 1997, pp. 15-16). In a more familiar realm, it is the tendency of a bird to lie still and apparently stunned after banging into a closed window.

Animals in the wild follow this freeze response with a spontaneous discharge of the energy from these chemicals, often in the form of a rapid shaking or twitching motion. The bird that lies still after crashing into the window eventually starts to shake, then flies away. Animals who go through this discharge process actually become more resilient, while those not allowed to complete the discharge become weaker and more vulnerable (Levine, 1997; Scaer, 2001).

Like other animals in captivity, human beings have lost the art of discharging the freeze response. According to Levine (1997), our traumatic symptoms “stem from the frozen residue of energy that has not been resolved and discharged; this residue remains trapped in the nervous system where it can wreak havoc on our bodies and spirits” (p. 19). According to Levine, “The physiological evidence clearly shows that the ability to go into and come out of this natural response is the key to avoiding the debilitating effects of trauma. It is a gift to us from the wild” (p. 17).

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