



MANAGEMENT OF PANIC IN VETERANS WITH POST-TRAUMATIC STRESS DISORDER

Annabel Prins, Ph.D. and Pamela J. Swales, Ph.D.



Annabel Prins

Twenty-eight to 55 percent of veterans with post-traumatic stress disorder (PTSD) will also meet diagnostic criteria for panic disorder or panic disorder with agoraphobia (1,2). This complex and usually chronic symptom presentation has led to the development of innovative treatment programs that combine exposure and cognitive processing treatment for PTSD with panic control treatment for Panic Disorder (PD) (3). The success of these combined treatments with civilian crime victims appears quite promising (4). To date, there has been no systematic investigation of the treatment of PTSD with comorbid panic attacks in veteran populations.



Pamela J. Swales

Panic control treatment (PCT) is an empirically-supported treatment developed in the 1980's by David Barlow and his associates (5). PCT begins with a strong psycho-education component that delineates the difference between types of anxiety and panic attacks. It places special emphasis on how these negative emotional states differ across the three major response channels (i.e., physical, cognitive, and behavioral). The second step introduces the patient to the role of hyperventilation in producing panic sensations. It also provides instruction in breathing retraining and relaxation. (It should be noted that the importance of this step has recently been questioned (5)). The third step in PCT is to identify and challenge distorted beliefs about anxiety and panic. The two types of cognitive distortions most often challenged are catastrophic thinking and probability overestimation. The fourth step involves interoceptive exposure. This involves repeated exposure to anxiety-provoking internal sensations (e.g., pounding heart, sweating, numbness). For those patients with agoraphobia, the last phase of treatment involves in-vivo exposure (i.e., graduated exposure to what is being avoided), and interoceptive exposure combined with in-vivo exposure. Detailed PCT manuals are available for both the patient and the therapist (6,7). Perhaps the most comprehensive and up-to-date manual is entitled, *Mastery of Your Anxiety and Panic (MAP-3)* (7).

Over the past 5 years we have implemented an abridged form of panic control treatment in both our inpatient and outpatient PTSD treatment programs for male and female veterans. PTSD in these veterans is complex and chronic with frequent psychiatric and medical comorbidities. In addition to comorbid panic attacks and PD, the most frequent and common comorbidities are depression, substance abuse, chronic pain, diabetes, and hypertension (8-10). Consequently, treatment for these veterans is often multi-modal and includes medications, trauma-focused individual or group therapy, and participation in relapse prevention programs.

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FROM THE EDITOR...

Adjusting to the “new normal” is challenging, particularly when “normal” isn’t really established. The impending war with Iraq (at press time), the uncertainty of the war’s impact on global affairs, and the recent warnings by the Homeland Security Advisory System urging citizens to prepare for a biological attack have combined to raise anxiety to new levels. Veterans and the general population are asking: “What do I do for my family, and myself?” Similarly, clinicians are asking: “What do I do for my clients, patients, my family, and myself?” Rather than attempt to summarize coping strategies in this limited space, I thought it might be helpful to list a few internet pages (of many) that represent current thinking about coping and have a future issue feature a detailed article.

Websites for Clinicians

National Center for PTSD

“How terrorist acts may affect veterans”
http://www.ncptsd.org/facts/disasters/fs_veterans_disaster.html

“Coping with PTSD and recommended lifestyle changes for PTSD patients”
http://www.ncptsd.org/facts/treatment/fs_coping.html

“Terrorists attacks and children”
http://www.ncptsd.org/facts/disasters/fs_children_disaster.html

National Institute of Mental Health

“What are scientists learning about trauma in children and adolescents?”
<http://www.nimh.nih.gov/publicar/violence.cfm#viol6>

Websites for the general population

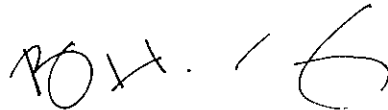
American Psychological Association

“Coping with terrorism”
<http://helping.apa.org/daily/terrorism.html>

National Mental Health Association

“Living your life during terrorist threats and other challenging times”
<http://www.nmha.org/reassurance/terrorism.cfm>

“Tips for older adults”
<http://www.nmha.org/reassurance/olderadulttips.cfm>



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As providers of PCT, our focus has been on panic attacks (trauma-cued and non-trauma-cued), anxious apprehension, generalized anxiety, and selected avoidance behaviors. We have found that this specific focus on panic and anxiety can bring about symptom relief without negatively impacting the complicated relationships veterans can have with their PTSD diagnosis (e.g., service connection, identity tied to military trauma). In this article, we address our experiences modifying and applying PCT in this population.

Step 1: Psychoeducation and Assessment

At the heart of this initial phase of treatment is a clear description of what is and what is not panic, and the importance of self-monitoring panic attacks and anxiety experiences. (The MAP-3 manual provides detailed descriptions of typical panic attack symptoms, typical agoraphobic situations, typical ways of coping and several self-monitoring forms.) Because our patient population experiences trauma-cued panic attacks, we have modified the panic attack record to reflect these events. As may be expected with complex PTSD, we have also found that our population has significant problems with attention, sustained concentration, abstraction, memory, and reading ability. Consequently, we work hard to use terminology and concepts that are readily understandable. For example, although we

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talk about cognitive, physical, and behavioral responses during a panic attack or while anxious, we often use terms like “think”, “feel” and “do”. We also spend additional time on evaluating each veteran’s understanding of basic concepts (e.g., having patients provide a summary of what they know about panic and anxiety).

Our first goal is to be confident that patients are able to identify different types of panic attacks (e.g., trauma-cued, situational, unexpected, reality-based) and that they can distinguish generalized anxiety (we call it “worry”) from anxious apprehension (we call it worry about having panic attacks or their consequences). Our second goal is to be confident that patients understand the normal and functional significance of anxiety (we often call it “readiness”) and panic attacks (we call it “fight or flight”).

Our awareness and modification of PCT to our population’s cognitive challenges has also been extended to our assessment process. We have found that many of the instruments used in outcome studies are too long and utilize language that is too difficult for our patient population (e.g., “palpitations”, “tachycardia”, “depersonalization”). After careful review of existing measures, we have found the following questionnaires to be psychometrically sound, quick to administer, easy to read, “patient-friendly” and clinically useful (i.e., they provide clear targets for treatment): (a) the Body Sensations Questionnaire (10); (b) the Cognitions Questionnaire (10) and; (c) Mobility Inventory (11).

Step 2: Hyperventilation and Learning Physical Control

We start this step by having patients count the number of breaths they take in one minute. We observe differences in rate and generate hypotheses about why such differences exist (e.g., weight, medications, coffee consumption, etc.). Next, we have the patients purposefully “over breathe” (i.e., hyperventilate) for about one minute. We participate in this exercise ourselves and encourage patients to go beyond the point of being comfortable. The review of sensations that follows is often the first time that patients realize that certain sensations associated with panic and anxiety (e.g. lightheadedness or feeling “spacey”) can be created and produced. It also provides an opportunity to conceptualize these sensations as unpleasant rather than something to be feared. This recognition is, of course, the goal of the exercise. We make sure to comment on our sensations so as to normalize their experience and we make sure to identify other physical experiences that are profoundly unpleasant but typically not feared (e.g., a cramp in one’s leg, headaches, etc).

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We have consistently found that an elaborate explanation of breathing physiology is not needed and that the information provided in the MAP-3 manual on this topic can be difficult to understand by all but a few (e.g., military nurses, medics). We have also found that most of our patients have at least some familiarity with diaphragmatic breathing and relaxation training (these are often topics covered in other parts of their treatment). Although we do practice “slowed” breathing and, time permitting, progressive muscle relaxation in-session, we are careful to point out that learning how to control one’s bodily responses does not mean that their bodily responses are dangerous. In other words, we don’t want to provide them with a technique that perpetuates avoidance of feared internal stimuli.

It is worth noting that we have observed relaxation-induced anxiety in quite a few of our patients. This is especially true for patients who survived their traumatic experiences through sustained hypervigilance. For these patients, the state of being relaxed is associated with an increased risk for re-traumatization. We explicitly recognize this possibility, and encourage the careful examination of why this may have been functional in the past but not now. If it is determined that the relaxation-induced anxiety is the result of an increased focus on physical sensations and fear of these sensations, relaxation and/or breathing retraining is added to the list of interoceptive exposure exercises (see below).

Step 3: Cognitive re-structuring

In addition to the classic cognitive beliefs associated with panic disorder and included in the Agoraphobic Cognitions Questionnaire (e.g., “I’m going to die, throw-up, pass out, lose control,” etc.), there are a few beliefs that appear to be unique to this population. For example, there is often a fear that “losing control” will mean seriously hurting others. This makes sense in light of military training that emphasizes “fight” rather than “flight”. There are also beliefs (observed to be more common in our female veterans), that a panic attack will lead to a prolonged dissociative or flashback episode. We challenge these beliefs in the same way we do other predictions regarding panic.

As mentioned in the introduction, the two types of cognitive distortions most frequently encountered in panic disorder are probability overestimation and catastrophic

thinking. Probability overestimation is reflected in statements that over-predict the likelihood of something bad happening (e.g., “I am going to die;” “ I am having a stroke”). Catastrophic thinking is reflected in statements that describe an event or experience as awful, dangerous, insufferable or catastrophic when it is not. Examples of this include statements like, “Other people might notice my anxiety and that would be awful” or “The symptoms of anxiety are too unbearable.” Often the catastrophic cognition is predicted with certitude.

Challenging these catastrophic and over-predictive cognitions requires regular and careful attention to facts. We have found the following challenges and statements useful in our work:

1. “How many times have you felt this way...and how many times has the feared outcome occurred?”
2. “What are the real chances of this outcome occurring?”
3. “What is the evidence for and against this prediction?”
4. “Just because you feel frightened (e.g., or just because you feel your heart beating fast) does not mean you are at an increased risk for....(a feared outcome).”
5. “You can cope with this attack because there is no real danger.”
6. “Panic attacks are time-limited and manageable.”
7. “It does feel awful doesn’t it? But so what if you are uncomfortable or anxious for awhile?”

We have found it very important to validate and normalize panic responses to truly dangerous situations in their past while, simultaneously, facilitating an understanding and acceptance of current symptoms as not dangerous or insufferable, and not indicative of actual or impending danger.

Step 4: Interoceptive exposure

Because so many unexpected panic attacks are triggered or cued by internal sensations, this step is critical to PCT. In order to identify sensations that are potentially frightening (i.e., those most similar to what is experienced during a panic), we review the veterans' responses to the Body Sensations Questionnaire. We then introduce the concept of exposure as a treatment component often by making reference to how specific phobias are treated. In other words, we talk about the value and importance of experiencing the feared situation (here, physical sensations) repeatedly and long enough so that one can learn that the physical sensations are not harmful (habituation). We then provide various opportunities for repeated exposure trials that create physical sensations that mimic those experienced (and feared) during high anxiety and panic attacks. Exposure trials include breathing through a straw, running in place, spinning in a chair, stair climbing, and fast walking in the halls.

Although the VA is moving toward empirically-supported treatments for anxiety disorders (12), there is often a need to share the rationale for this component of the treatment with staff as well as patients. This consideration may be particularly true in residential or inpatient programs. On rare occasions, we have encountered some patient resistance to these exercises, and on occasion, medical contraindications. However, our greatest obstacle has been obtaining the support of other health care providers. Most health care providers view panic as something that has to be controlled (i.e. prevented). Although they are familiar with methods that decrease arousal or panic (e.g., medications, relaxation training) they are unfamiliar with the rationale and principles of interoceptive exposure. Indeed, interoceptive exposure is often viewed as something that could induce dissociation or some other trauma-related flashback, and consequently something to be avoided.

In five years, we have never experienced a problem subsequent to interoceptive exposure exercises. This is not to say that trauma-related memories have not surfaced. Our emphasis, however, has focused on teaching the veteran, by personal experience, that one does not have to be afraid of the physical sensations associated with high anxiety or panic attacks. Almost without exception, veterans report that these exercises are of great value in enabling them to break the automatic connection between physical sensations and feared outcomes.

Step 5: In-vivo exposure

Usually, this last step is not formally targeted in residential or inpatient settings. We do not have the opportunities to provide therapist-assisted in-vivo exposure "off the unit." However, the nature and structure of the inpatient program provides frequent naturalistically-occurring opportunities to confront situations (e.g., interpersonal conflict, meetings, classroom situations, medical examinations and procedures) that are often avoided because of fear and anxiety. Thus there are opportunities to experience and confront anxiety and panic symptoms. Patients may also submit "weekend passes" for treatment team approval. If granted, these often provide for additional exposure experiences.

In outpatient settings, there is consideration of what daily activities are avoided in order to minimize physical sensations (e.g., coffee, exercise) as well as more typical agoraphobic situations included in the Mobility Questionnaire (e.g., shopping malls, restaurants, etc). A hierarchy of feared sensations and situations is created and patients are paired with a peer to complete designated graduated exposure exercises. (This has the added benefit of limiting social isolation in this population). Many of these exercises will include purposeful creation of physical sensations in avoided situations (e.g., standing in line after drinking coffee or exercising). We've had a number of veterans who were severely agoraphobic return to active recreational and occupational pursuits.

Conclusion

In this article we have identified a few ways in which we modified PCT for a veteran population with comorbid PTSD and panic attacks. We also reviewed several considerations for the effective implementation of PCT as a distinct component of comprehensive PTSD services. Our clinical experience with PCT for this population has been very favorable. Indeed, we believe that the increased tolerance for anxiety and panic obtained through PCT can generalize to other negative emotional states. In other words, PCT seems to facilitate acceptance of a broad range of negative emotions and this acceptance, in turn, helps patients to approach trauma-related material.

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NEW DIRECTIONS

Matthew J. Friedman, M.D., Ph.D.
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Hippocampal volume in PTSD

A number of brain imaging studies have detected smaller hippocampal volume among subjects diagnosed with PTSD. Utilizing structural magnetic resonance imaging (MRI), Doug Bremner and colleagues (1) at the Clinical Neurosciences Division of the National Center for PTSD were the first to report this abnormality among combat veterans. Independent replications of this finding have been described with combat-related and childhood sexual abuse-related PTSD in three additional reports (2-4).

In addition to these MRI reports, consistent results have come from two magnetic resonance spectroscopy (MRS) studies which have utilized the amino acid N-acetyl aspartate (NAA), a histochemical marker for the density and viability of neurons in the brain. In both, veterans with PTSD exhibited lower NAA levels in hippocampus (5) and medial temporal lobes (where the hippocampus and other key structures are situated) (6), although the former finding was only marginally significant. In no case was PTSD associated with either larger hippocampal volume or higher NAA levels in that region of the brain.

This result has had a major influence on the scientific and clinical communities as well as on the general public. It appears to be that there is a significant difference in brain structure that distinguishes individuals with PTSD from non-affected individuals. Therefore, it suggests that chronic PTSD meets the National Alliance for Mental Illness criterion for "a chronic brain disorder" along with depression and schizophrenia. Most importantly, as with any important scientific finding, it has raised a number of important questions, stimulated provocative scientific speculation, and generated additional research. One of the more intriguing hypotheses has been that PTSD-related abnormalities in the hypothalamic-pituitary-adrenal (HPA) system might be responsible for reducing the volume of the hippocampus (7). Two arguments in support of that speculation are: a) that stress-induced activation of HPA mechanisms in animals have been shown to produce atrophy of hippocampal neurons and defoliation of hippocampal dendrites (8) and b) that HPA-related reduction of hippocampal volume has been demonstrated in humans affected with Cushing's Disease and Major Depressive Disorder (9).

Recent research findings have specifically addressed the chicken-or-egg question generated by the previous studies. As explicated by Roger Pitman and colleagues (10) the questions are: did PTSD-related HPA abnormalities shrink the hippocampus of affected individuals or were people with smaller hippocampi more likely to develop PTSD in the first place? The cross-sectional studies, previously mentioned, cannot help us answer these important questions.

Roger Pitman has been one of the most thoughtful and creative investigators to tackle this problem. Through a twin study and a prospective longitudinal investigation, he and his colleagues have shown that smaller hippocampal volume is more likely a risk factor than a cause of PTSD. Utilizing a case-control design he conducted MRI assessments in which the hippocampi of combat exposed Vietnam veterans with and without PTSD were compared with their respective monozygotic twins who had not been exposed to Vietnam War trauma and who did not have PTSD (11). These investigators found smaller hippocampi in both the trauma-exposed twins with severe PTSD and in their unexposed non-PTSD identical twin brothers. In contrast, non-PTSD combat-exposed twins had larger hippocampi, as did their non-exposed monozygotic twin brothers. These findings clearly demonstrate that PTSD does not "shrink" the hippocampus and strongly suggest that smaller hippocampi among affected individuals preceded combat exposure, since non-exposed, non-PTSD twin brothers also had small hippocampi. Since monozygotic twins reared in the same household share the same environment as well as the same genes, these studies cannot, by themselves tease apart the unique contributions of these two factors. Further studies with dizygotic twins (who share the same environment but only some of the same genetic material) or from monozygotic twins reared apart, will be needed to address the nature vs. nurture question that remains to be addressed.

The second investigation (12) is a longitudinal study of 37 subjects exposed to a traumatic event, serious enough to generate an emergency room visit. MRI assessment of the hippocampus was carried out on all subjects within one week of the traumatic event and six months later, at which time 10 had PTSD and 27 did not. Hippocampal volume remained stable for both groups over this six-month interval, suggesting that progressive reduction of the hippocampus was not associated with the development of PTSD during this initial interval. Again, these results are suggestive rather than conclusive since it may take more than six months to produce such changes in brain structure or it may take more prolonged stress at an earlier developmental stage (as in chronic physical or sexual, child abuse) or there may be other brain structures, rather than hippocampus, that deserve our attention.

Indeed, the work of Michael DeBellis and others (13) with children and adolescents afflicted with maltreatment-related PTSD, suggests that we may need to look elsewhere to appreciate the impact of PTSD on brain structures. In comparison with control subjects, these children did not exhibit any reduction in hippocampal volume. Anatomical MRI brain scans, however, revealed significant reductions in intracranial, cerebral and prefrontal cortex, prefrontal cortical white matter, right temporal lobe volumes, and several areas of the corpus callosum. In addition, PTSD subjects exhibited larger frontal lobe cerebrospinal fluid volumes than control subjects. Preliminary research by Joan Kaufman at the National Center's Clinical Neurosciences Division appears to have independently replicated DeBellis' observations of reduced volume of medial and caudal sections of the corpus callosum among maltreated children and adolescents with PTSD. These findings strongly suggest that brain development is adversely affected by maltreatment-related PTSD.

As for traumatized adults, Canive and associates (14) observed focal lesions of white matter in combat veterans with PTSD but not hippocampal abnormalities. A recent study by Fennema-Notestine and associates (15) with female victims of intimate partner violence reported findings similar to those obtained by DeBellis, mentioned previously. Indeed, the observed reduction in the volume of supratentorial cranial vaults and in frontal and occipital gray matter correlated with the severity of childhood physical abuse, but not with either the severity of adult intimate partner violence or with the presence or absence of PTSD.

To summarize, results from structural brain imaging suggest that anatomic abnormalities may be more likely to result from childhood than from adult trauma. They also suggest that we need to focus our attention on other brain structures besides the hippocampus to get a more complete picture of the potentially deleterious impact of PTSD on brain structures. Finally, it is important to recognize that I have restricted this brief review to anatomic studies because I wanted to focus primarily on the hippocampal volume controversy. Very interesting data can also be found in studies of functional brain imaging that show marked abnormalities in regional cerebral blood flow of PTSD vs. non-PTSD subjects. Discussion of these findings will have to take place in a future column.

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WOMEN AND TRAUMA: A CLINICAL FORUM

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NC-PTSD

The role of self-defense training in preventing sexual revictimization

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In a recently published meta-analysis, a definite relationship was found between childhood experiences of sexual abuse (CSA) and adult experiences of sexual assault (1). Although the 19 studies included in this review utilized only civilian samples, the relationship appears to hold for active-duty and veteran women as well. For example, Merrill et al., (2) found that female Navy recruits who were sexually assaulted in adulthood were 5 times more likely to have a history of CSA than recruits without this history. Coyle et al., (3) found that over 50% of female veterans with a history of childhood abuse reported abusive experiences in adulthood. Clearly, there is a need for interventions that actively and directly target sexual revictimization.

To date, most well established and empirically-supported treatments for abuse or assault-related post traumatic stress disorder (PTSD) have not included a prevention component (4). Instead, the majority of these treatments have focused on ameliorating PTSD symptoms through prolonged exposure or through a systematic restructuring of beliefs associated with the trauma. Although some treatments do introduce "coping skills" (e.g., training in relaxation or breathing), the focus is on managing past and present feelings, not future interpersonal behaviors. It may not be surprising that these empirically supported treatments have been most effective in reducing re-experiencing and hyperarousal symptoms of PTSD and less effective in reducing detachment and numbing symptoms.

In contrast to these research-based "treatment" protocols, community-based rape crisis centers have a long history of providing self-defense classes as a rape prevention strategy to CSA survivors. Although these classes can vary tremendously with regard to frequency of contact, length of practice, instructor expertise, and philosophical foundation, most include training in how to use body parts (e.g., knees, elbows) as "weapons" against vulnerable "targets" (e.g., eyes, groin) as well as the use of impromptu weapons (e.g., keys, comb). There is often a strong feminist emphasis on divorcing female status from victim status and developing a fighting spirit (5). Assertive use of voice and body language are also emphasized. In their review of self-defense programs for women, Searles and Berger cautioned against police-sponsored courses that lack individual empowerment, and martial-arts models that exploit women's fear of crime (6). They, like the National Coalition Against Sexual Assault (7), recommend self-defense classes that combine martial arts techniques with a feminist philosophy, and prepare women for acquaintance rape as well as stranger assaults.

The effectiveness of self-defense training in preventing subsequent revictimization in CSA survivors has not been extensively studied. In fact, there are only a few longitudinal studies on the effects of self-defense training in general (i.e., not specific to CSA survivors), and these have focused on the psychological impact of the training, mostly in college women. There is indirect and anecdotal evidence that self-defense training may be important in preventing revictimization. For example, several studies have found that women who have successfully avoided acquaintance rape behaved in an assertive and action-oriented manner (8,9). Matt Thomas, creator of the self-defense course Model Mugging, has reported that 95% of those women who were assaulted after participating in his course (and reported back), were able to utilize the skills taught and avoided harm (10). By far, the most empirically-supported and consistent finding to emerge from this literature is the psychological benefit of participating in self-defense training. For example, Weitlauf et al., (11) found that participation in self-defense training produced a generalized increase in perceptions of self-efficacy. More specifically, and compared to women on a wait-list, participants receiving self-defense training reported higher levels of physical self-efficacy as well as increased levels of general coping, self-regulatory skills, and interpersonal assertiveness.

Preventing sexual revictimization in women with a history of CSA needs to include consideration of empirically supported risk factors. Amy Naugle and her associates have outlined several risk factors for revictimization (12). They include the presence of trauma-related symptoms as well as substance abuse. Women presenting with these risk factors may have difficulty recognizing or perceiving dangerous situations and/or responding to these situations effectively. Preliminary research, using videotaped scenarios of interpersonally risky situations, suggests that women with a history of sexual assault may be equally or more likely to perceive danger, but less likely to react effectively (e.g., resist a sexual advance). Training in self-defense may provide the necessary skills for women to respond assertively and effectively to threats of victimization.

LESSONS LEARNED FROM 9/11: CONSIDERATIONS IN THE DEVELOPMENT OF SCHOOL-BASED INTERVENTIONS FOLLOWING LARGE SCALE VIOLENCE

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The attacks on the World Trade Center World directly exposed over 150,000 school children within a two hour period to the sights, smells and sounds of the planes crashing into the towers followed by their collapse. Virtually all children in Ground Zero schools were personally physically exposed to one or more effects of the attack, including 73% who were in or near the cloud of smoke and dust (1). Despite the significant psychological distress experienced by the school community, it is not surprising that the fourteen public schools in the Ground Zero area had as their top priority the practical tasks of recovering from the destruction of the physical environment and stabilizing functional capacity. Of the fourteen public schools in the Ground Zero area, five required evacuation. All required intensive health review and cleaning related to the pervasive chalky dust that had traveled through air ducts and windows and settled on blackboards,

books and computer keyboards. Clean-up operations were completed with remarkable speed. Even so, the last school to return to its home site occurred February 4, 2002, nearly 5 months after the attack. During this time, mental health intervention largely took the form of support and consultation to administrators, teachers, and parents, as well as psycho-education and normalization of expectable symptoms of acute trauma for all groups, including students.

At the half-year anniversary of 9/11, parents and educators noted that there was continued and significant psychological distress in many students. Indeed, this observation was consistent with the results of a landmark study of 8000 school children commissioned by the Board of Education conducted at 6-months post trauma (1). The sample was drawn from 94 schools, grades 4 through 12, across the entire City of New York, with the Ground Zero area over sampled relative to other geographic areas. A broad range of mental health problems were observed at higher than expected rates, with

the most pronounced elevations obtained for posttraumatic stress disorder, agoraphobia, conduct disorder, and separation anxiety. The prevalence of PTSD in NYC school children was 11% compared to the 2% observed in an appropriate comparison study (2), indicating PTSD in NYC students was 5½ times that of rate obtained in



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the comparable population. The report also noted that only a minority of students had sought treatment either within the school system or from an outside mental health professional. While the proportion of children with PTSD who spoke to a school guidance counsel or school social worker was higher in Ground Zero schools, roughly two-thirds of children had not sought out or received any treatment.

The obtained rate of disorders is likely to represent the proverbial "tip of the iceberg." There are as yet unquantified subsyndromal symptoms that may negatively impact on functional status and quality of life. For example, panic attacks and symptoms of separation anxiety and agoraphobia that do not meet criteria for the disorder may still produce lateness or poor attendance at school, contributing further to the already high level of stress in affected families. Given this state of affairs, it is useful to consider what strategies might be implemented to enhance mental health in school children. There are only a handful of studies that have explored interventions with children and adolescents traumatized by large-scale disaster or single incident events (3-7). In the studies that had a "no-intervention" comparison group, children who received services were better off than those who did not (3, 5,6). It is notable that all the studies were completed with youth who were symptomatic at least one year post trauma, with severity of symptoms typically close to that which would be observed for full-blown PTSD. The implementation of intervention at dates so many months following the large-scale community traumas is likely due to the tremendous practical and logistical difficulties involved in

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such efforts. This inevitably circumscribes the conclusions that we can make. Nevertheless, the data indicate that youth who are symptomatic at a minimum of one-year post trauma are better off for having some form of intervention and are better off than those who do without. To our best knowledge, then, we can say that the first imperative of health providers - "to do no harm" - appears to have been established. Secondly, it appears that improvement is not simply the result of passage of time or the normal course of recovery, but is actively facilitated by treatment. This is true for both children (3-5,7) and adolescents (6).

The risks involved in not intervening with youth who have been exposed to traumatic violence have recently been suggested in research that has reported myriad problems in traumatized youth by late adolescence and include increased rates of posttraumatic stress disorder, additional mental health disorders, interpersonal problems, overall behavior problems, academic failure and health problems (8).

School based interventions (3, 6) have the advantage of providing psycho-education and outreach to a high proportion of affected youth. Organization of interventions in schools meets the twin needs of maximizing participation and monitoring of quality of implementation by school based mental health professionals. Furthermore, a school-based program may produce an aura of acceptability for mental health intervention and create a social context in which trauma related psychological symptoms are destigmatized.

It remains unclear which particular treatment intervention should be adapted and implemented in the school system. However, a reasonable beginning is the proposal of a model and the minimum requirements for it. The largest and most rigorously evaluated intervention for children to date has been reported by Chemtob and colleagues among children two years following the Iniki hurricane in Hawaii (4). The treatment represents an intervention model that is brief, theme-focused, and targeted for symptomatic children. The intervention was tested in a controlled trial of 250 children ages 8-12 (grades 2 through 7) across 10 public schools. As such, it satisfies the highest standard of evaluation (evidence based) and is the only intervention for traumatized children following large-scale disaster for which this level of outcome evaluation has been obtained. In addition, it shares many features of other interventions for which there is some evidence of effectiveness (3-7) and thus represents a prototype of the key features of any effective treatment for traumatized children. This intervention may serve as a prototype model for our continuing efforts for the following reasons.

First, the model is organized around children's most prevalent concerns and to a lesser extent their symptoms. Trauma creates specific disruptions and concerns across all ages (10). The central four disruptions are: 1) diminished sense of

safety and increased fear, 2) experience of loss and associated grief and anger, 3) diminished sense of the world/people as good and trustworthy, and 4) diminished sense competency and mastery (e.g., reduced school, social and home functioning).

The treatment model is organized with each of these concerns as a theme of intervention with a certain number of sessions devoted to each theme. This is a very wise and developmentally informed approach to disaster-related treatment protocols that are expected to be implemented across a great number of children of different ages. Notably, the New York City Board of Education study found age-related differences in the prevalence of disorders. Children in the 4th and 5th grade had higher rates of the anxiety disorders such as agoraphobia and separation anxiety, while the adolescents showed significantly higher rates of depression and conduct disorder. These differences are interesting as they are consistent with and support theories concerning the developmental issues of growing autonomy and independence. They also point out the reality of changing symptoms profiles across different age groups. The organization by themes provides an overarching structure to guide mental health providers in implementing the treatment and heightens their sensitivity to the central issues that they will confront. Interventions related to specific symptom sets can be added on in modular fashion as relevant.

The model uses two specific interventions shared by all trauma therapies: psycho-education and normalization of the psychological and functional consequences of trauma, and age-appropriate "emotional processing" of core fears (via talk, expressive art or play). Notably, additional types of interventions which have been successful for youth exposed to other traumas (physical and sexual abuse) include stress management techniques, cognitive interventions and the inclusion of a parental treatment component, which might be helpful depending on the age and developmental needs of a particular set of children. (8). Importantly, the study demonstrated that school counselors learned and effectively administered the intervention, with appropriate supervision. It is important that any intervention model be able to be effectively implemented by the personnel in the schools. The use of school-based professionals such as school counselors serves an important long-term goal of intervention, which is maintenance of a trauma-focused knowledge base among those continuously working with youth across several years. It also enhances continuity in the professional knowledge base of school staff, providing competence and guidelines for appropriate action in the ongoing evolution of the consequences of events such as 9/11 and readiness for appropriate action for future events. Lastly, the intervention was shown to be effective in either a group or individual format, again providing a measure of flexibility across the differing needs and resources of variously affected schools and grades.

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Our own experience with 7 of the Ground Zero schools adds to considerations for the development of such programs. The first is that it is likely that cognitive-behavioral modalities are preferable to open-ended nonspecific treatments. Active, focused, well-articulated, and time-limited interventions appeared to reduce the fear of the unknown for parents and children entering an intervention program. This is characteristic of cognitive-behavioral as compared to supportive therapies. Furthermore, evidence related to the treatment of traumatized children indicates the superiority of such treatments compared to nonspecific treatments for other forms of traumas (9). Special considerations and interventions should be given to adolescents. They are much more likely to express and attempt to modulate their fear and emotional distress through risk related behaviors such as anger, aggression, drinking and drug use. Interventions at the adolescent level should be tailored with these problems in mind.

Last but not least, special considerations should be given to the teachers and mental health providers. Therapists and teachers are not immune to the effects of large-scale traumas such as 9/11 trauma in their own lives. Furthermore, those that assist traumatized children have an additional performance burden as they are called upon to provide support, comfort, knowledge and clinical services and incidentally act as role models for students and parents in the trauma recovery process. These multiple demands can lead to deterioration in effectiveness in role and personal life functioning (10). Teachers may be further burdened by a sense of inadequacy when confronted with newly emerging problematic behaviors in the classroom. Specific funding should be put aside to provide supportive, educational and therapeutic services for the teachers and other professionals who are daily exposed to the students. Such services should include expanded education concerning such issues as behavior management and de-escalation of emotional crises in the classroom. In addition, time-limited and evidence based interventions should be made available to address the therapeutic needs of these professionals.

The current available controlled studies of school based interventions as well as the emerging consensus by expert clinicians give good reason to be optimistic about the feasibility and potential effectiveness of school based programs. The remaining challenges are sufficient funding and continued cooperative spirit among schools, parents and mental health providers.

We need yet to determine whether this community trauma is best understood generically as a disaster, similar in its effects to natural disasters such as hurricanes and floods, or whether the effects will be better understood as an event of large scale violence perpetrated by human design. Careful evaluation of symptom sets over the next months and years will be needed

to make this determination and help guide treatment development for children who develop chronic, long-term problems.

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