THE JOURNAL OF
CLINICAL PSYCHIATRY

VOLUME 67 2006 SUPPLEMENT 2

SUPPLEMENT

After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow

THE OFFICIAL JOURNAL OF THE AMERICAN SOCIETY OF CLINICAL PSYCHOPHARMACOLOGY

Background Information

To obtain credit, read the material and complete the Posttest and Registration Form on pages 80–82 or on SuppleNet at www.CMEInstitute.com.

CME Objectives

After completing this educational activity, you should be able to:

- Describe the short-term and long-term impact of mass disasters on the mental health of those affected.
- Employ appropriate assessment tools to assist in the identification and diagnosis of those suffering from trauma-related mental disorders.
- Explain the neurobiology of posttraumatic stress reactions.
- Compare mechanisms of coping with traumatic events on the individual level as well as the community level, taking cultural factors into consideration.
- Identify risk factors for development of PTSD and predictors of good response to treatment.
- Identify and distinguish treatments that are effective, ineffective, or even harmful.
- Assess resiliency and recovery in individuals affected by trauma.

Statement of Need and Purpose

Recent large-scale disasters, natural and otherwise, have brought posttraumatic stress disorder (PTSD) back to the forefront of mental health care. The burden of PTSD on the individual and on society is a heavy one, and providers of health care, especially mental health care, need to be aware of the wide-reaching effects of traumatic events. This activity was designed to meet the needs of participants in CME activities provided by the CME Institute of Physicians Postgraduate Press, Inc. who have requested information on traumatic events and PTSD. There are no prerequisites for participating in this activity.

Accreditation Statement

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of the CME Institute of Physicians Postgraduate Press, Inc. and PPS International Communications.

Credit Designation

The CME Institute of Physicians Postgraduate Press, Inc. designates this educational activity for a maximum of 7 *AMA PRA Category 1 Credit(s)*™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Date of Original Release/Review

This Supplement was published in February 2006 and is eligible for CME credit through February 29, 2008. The latest review of this material was January 2006.

Faculty

Chair: Jonathan R. T. Davidson, M.D. ***Faculty:*** Richard A. Bryant, Ph.D.; Kathryn M. Connor, M.D.; Edna B. Foa, Ph.D.; Alexander C. McFarlane, M.D.; Frank G. Njenga, F.R.C.Psych.; Juan Carlos Otero, M.D.; Daya J. Somasundaram, M.D., F.R.C.Psych.; Dan J. Stein, M.D., Ph.D.; and Willem A. C. M. van de Put, M.A., M.Phil.

Faculty Disclosure appears on the inside back cover.

Disclosure of Off-Label Usage

In this Supplement, faculty may be presenting investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling. This information is intended solely as continuing medical education and is not intended to promote off-label use of any of these medications. Please consult the paragraph titled "Disclosure of Off-Label Usage" at the end of each article for a complete listing of off-label or investigational uses. If you have questions, contact the medical affairs department of the manufacturer for the most recent prescribing information.

Review Process

Supplements to *The Journal of Clinical Psychiatry* undergo a different peer review than journal articles. Their review process involves 3 tiers: (1) the entire faculty discusses the content at a peer-review planning session; (2) the chair reviews the activity for accuracy and fair balance; and (3) a member of the External CME Advisory Board reviews the activity to determine whether the material is evidence-based and objective.

Acknowledgment

This Supplement was presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and was independently developed by the CME Institute of Physicians Postgraduate Press, Inc. and PPS International Communications pursuant to an educational grant from Pfizer Inc. Editorial assistance and honoraria were provided by Physicians Postgraduate Press, Inc. and PPS International Communications. The opinions expressed herein are those of the faculty and do not necessarily reflect the opinions of the CME provider and publisher, the joint sponsor, the American Society of Clinical Psychopharmacology, or the commercial supporter.

THE JOURNAL OF CLINICAL PSYCHIATRY

VOLUME 67 **2006** **SUPPLEMENT 2**

The Journal of Clinical Psychiatry (ISSN 0160-6689) is published monthly by Physicians Postgraduate Press, Inc. Address correspondence to P.O. Box 752870, Memphis, TN 38175-2870; phone inquiries to (901) 751-3800.

Periodical postage paid at Memphis, TN, and additional mailing offices. POSTMASTER: Send address changes to Circulation Department, Physicians Postgraduate Press, Inc., P.O. Box 752870, Memphis, TN 38175-2870.

Subscriptions for individuals:
US: $132.00; Int'l: $176.00
Single issues: US: $27.00; Int'l: $42.00

The Journal of Clinical Psychiatry is indexed in Index Medicus, EMBASE/Excerpta Medica, Psychological Abstracts, Current Contents, Science Citation Index, Hospital Literature Index, Biological Abstracts, Cumulative Index of Allied Health and Nursing, International Nursing, PsycINFO, Chemical Abstracts, Adolescent Mental Health Abstracts, and Alcohol and Alcohol Science Problems Database.

The Journal of Clinical Psychiatry is owned and published by Physicians Postgraduate Press, Inc., 3175 Lenox Park Blvd., Suite 409, Memphis, TN 38115. All articles appearing in this publication, including editorials, letters, and book reviews, represent the opinions of the authors and do not necessarily reflect the official policy or opinions of Physicians Postgraduate Press, Inc. or the institution with which the author is affiliated, unless this is clearly specified.

THE JOURNAL OF
CLINICAL PSYCHIATRY

VOLUME 67 **2006** **SUPPLEMENT 2**

ARTICLES

CME SECTION

Foreword

After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow

Jonathan R. T. Davidson, M.D.

On December 26, 2004, a powerful earthquake rocked the ocean floor off the coast of northern Indonesia, abruptly displacing a 15,600 square mile area of the floor some 50 to 70 feet upward. The earthquake, measuring 9.0 on the Richter scale, triggered a massive tsunami that propagated across the ocean's surface at speeds of up to 500 mph, reaching the nearest shores in a matter of minutes and arriving up to 8 hours later at coastlines some 4,000 miles distant from the epicenter. Devastation was massive as waves measuring 10 to 40 feet in height enveloped shores and surged up beaches, leveling vegetation, buildings, and entire villages before receding back into the ocean. In the minutes, hours, and days after it struck, the tsunami caused more casualties than any other in recorded history, killing over 280,000 people in Indonesia, Thailand, Malaysia, Myanmar, India, Sri Lanka, and many other countries located on the rim of the Indian Ocean and the Bay of Bengal. Notable for its scale of devastation, for the sheer numbers of people caught up in the resulting chaos, and for the global humanitarian response that followed, the Asian tsunami is an extreme example of disaster.

During the days and weeks following the tsunami, the intensive global media coverage vividly documented the physical consequences of the tsunami's destructive power. From the air, we saw turbulent, sullied shorelines, aerial views of entire villages leveled, and acres of bare land stripped of vegetation. At eye level, close-ups of bloated and twisted corpses trapped among the debris fought for new airtime with images of bulletin boards of missing persons and makeshift morgues. News reports of the harried and urgent activities of medical teams, morgue workers, and relief operators reinforced the world's perception of the physical costs of the tsunami and society's best efforts to address them.

By comparison, the psychological and psychosocial effects of the tsunami went relatively unnoticed. Identifying these effects presents a far more subtle challenge, but one that must be met if their long-term consequences are to be adequately recognized and mitigated. Thus, in the postdisaster setting, comprehensive programs of recovery and rehabilitation need to address such difficult questions as How has the tsunami affected the mental health of survivors? What psychiatric and psychosocial resources are available? How should they best be used? What are the ongoing needs of affected communities? Who is especially vulnerable? and What needs to be done in the future by way of disaster planning and mitigation for mental health?

Acknowledging the dreadful devastation inflicted by the Asian tsunami, this disaster nevertheless presents an opportunity to characterize the destructiveness of mass trauma for individuals and societies not as a function of the physical consequences but as a function of the psychosocial effects. If left unchecked, the social scars and instability that are inevitable outcomes of disaster have the potential to cause a human toll that is in many ways more substantial than the physical disfigurement that is apparent to all. Long after the dead have been buried, villages and towns rebuilt, and infrastructure replaced, psychiatric distress and psychopathologies developed as a consequence of initial exposure and loss, and exacerbated through everyday stressors encountered in the postdisaster environment, have the potential to reduce quality of life and unnecessarily prolong human suffering with a resultant delay in community recovery.

FACILITATING REHABILITATION AND AWARENESS

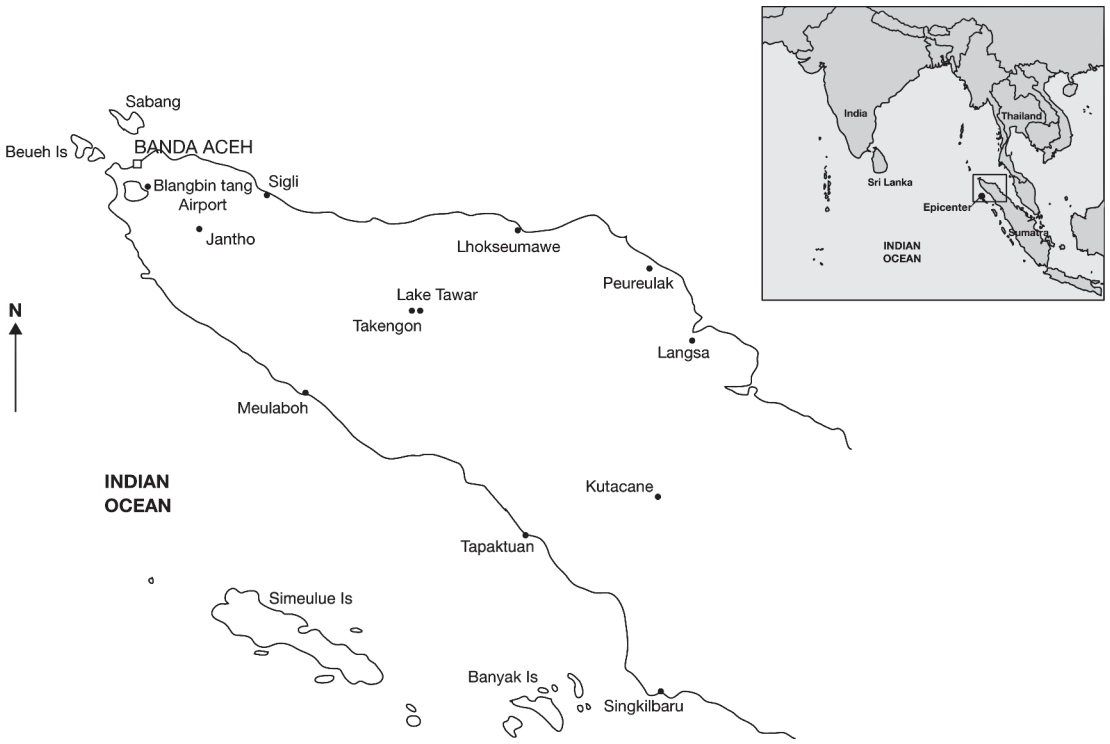
The First World Conference "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow" and ensuing monograph were supported by an unrestricted grant from Pfizer Inc. The conference was convened in Bangkok, Thailand, on February 2–3, 2005, to facilitate an increased awareness of the impact of mental health problems arising from the tsunami in the South-Asia region. The meeting delegates were psychiatrists, clinical psychologists, and other mental health workers from Thailand, Sri Lanka, India, and Indonesia. An internationally renowned faculty was invited to share with the delegates their extensive knowledge and experience in managing posttrauma mental health. In addition to assisting local health care workers in dealing with the impending rise in mental health problems in the affected communities, the forum was an opportunity

From the Department of Psychiatry and Behavioral Science, Duke University Medical Center, Durham, N.C.

Presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and supported by an educational grant from Pfizer Inc.

Corresponding author and reprints: Jonathan R. T. Davidson, M.D., Director, Anxiety and Traumatic Stress Program, Department of Psychiatry and Behavioral Science, Duke University Medical Center, Durham, NC 27710 (e-mail: jonathan.davidson@duke.edu).

Figure 1. Map of the Tsunami-Affected Aceh and North Sumatra Provinces in Indonesia[a]



[a]Adapted with permission from the United Nations Office for the Coordination of Humanitarian Affairs-Relief Web (www.reliefweb.int). Inset reference map courtesy of the University of Texas Libraries, The University of Texas at Austin.

for the delegates and faculty to establish collaborative projects with the goal of facilitating the rehabilitation of community mental health.

TSUNAMI IMPACT AND REHABILITATION EFFORTS DURING THE ACUTE PERIOD

During the conference, delegates from the 4 most affected countries—Indonesia, Thailand, India, and Sri Lanka—provided accounts of the physical and psychological damage inflicted on their countries by the tsunami and an update on measures being taken to address the impact of the disaster. These presentations are summarized below.

Indonesia

Irmansyah, M.D., Department of Psychiatry, Cipto Mangunkusumo Hospital, University of Indonesia School of Medicine, Jakarta, Indonesia.

Nanggroe Aceh Darussalam (Aceh) and North Sumatra were the worst affected provinces in Indonesia (Figure 1). People along a 127-mile west coastal area of Aceh, including Banda Aceh, the capital city of Nanggroe Aceh Darussalam province, barely had a moment to react to the earthquake before the tsunami struck. Almost all buildings and infrastructure in this area were leveled, more than 110 bridges were destroyed, and parts of the main road in western areas of Aceh were under water. One hundred and thirty thousand people were killed in the first 15 minutes of the disaster, many more went missing, and half a million were forced to live in temporary shelters. There were no telecommunications, electricity, clean water, or food.

All inhabitants of Aceh were affected directly or indirectly by the disaster. In the immediate aftermath, an advance mental health team and other professional volunteers reported many acute psychiatric cases among the survivors. Psychological problems were widespread, with many survivors facing unimaginable traumatic experiences and loss of family members, possessions, and their communities. These psychological problems were exacerbated when the survivors were faced with having to live in camps for months, a lack of security, and an uncertain future.

Massive psychosocial support is still needed. Unfortunately, local mental health resources are limited. Before the disaster, there were just 5 psychiatrists for the 4 million inhabitants of Aceh. The only specialist mental health hospital in Banda Aceh was affected by the tsunami and was not operational for the first month after the tsunami. There were no specialist facilities in other areas, and many primary health clinics and district hospitals were destroyed. Many health care professionals were themselves survivors or missing persons.

Immediate humanitarian efforts, including psychosocial support, poured into Aceh following the tsunami. Local

Figure 2. Map of the Tsunami-Affected Coastal Provinces of Thailand[a]

[a]Based on map courtesy of the University of Texas Libraries, The University of Texas at Austin.

and international nongovernmental organizations, mental health professionals and volunteer mental health workers, and many others went to Aceh to give assistance, providing much needed relief for some of the survivors. However, these spontaneous and unorganized efforts were largely ineffective and contributed to the chaos in the first few days of the disaster. Most psychosocial support during the acute phase provided only entertainment, the methods used were often unreliable, and most forms of support lasted for only a short term. These efforts were arguably inappropriate if the intention was to provide optimal psychological help and rehabilitation for the tsunami's victims.

Ministry of Health and World Health Organization (WHO) officials in Jakarta, assisted by mental health professionals, recognized this unfortunate situation and subsequently implemented more structured psychosocial interventions with a long-term perspective. Interventions included the restarting of Aceh Mental Hospital to function in a referral capacity, providing psychological care to trauma survivors in community health centers, supporting other points of service delivery such as the military hospital and the general hospital, integrating mental health with other health services, providing training for volunteers and training for trainers in basic counseling to strengthen community health services, and creating an education program to increase community awareness.

Thailand

M. L. Somchai Chakrabhand, M.D., Director General, Department of Mental Health, Ministry of Public Health, Thailand.

The Andaman Sea of the Indian Ocean, renowned for its crystal clear water, white fine-grained sand, and a multitude of corals and islands, made a lasting impression upon visitors who named it The Pearl of Andaman. Each year, tourists from within and outside of Thailand flocked to provinces in the region, including Phuket, Phang Nga, Ranong, and Trang, for their seaside vacation. All of that changed at 8:00 a.m. on Sunday, December 26, 2004, when 40- to 50-foot waves crashed ashore over a 250-mile stretch of Thailand's western coastline (Figure 2). More than 5000 people were killed, over 10,000 injured, and more than 100,000 affected either directly or indirectly. Homes throughout 490 fishing villages were left in ruins, 2400 large and small fishing boats were lost, and 5000 houses and 3700 other buildings were destroyed.

Following early reports of casualties in Phuket, the Ministry of Public Health immediately sent a team of more than 100 doctors by plane. Once the scale of the disaster became apparent, health officials convened an emergency meeting and a command center was established in Phuket to coordinate health services for all 6 affected provinces. However, communication failure meant that little was known about the damage and losses suffered from the Phang Nga province.

Within a day of the tsunami, the Department of Mental Health convened an emergency meeting to assess the disaster's impact on the population. The Mental Health Center for Thai Tsunami Disaster (MHCT) was established with clinics in Bangkok and at Suan Saranrom Hospital in Surat Thani, which is centrally located between Krabi, Phang Nga, and Phuket provinces. The purpose of MHCT was to collaborate with other health providers in the delivery of medical and psychosocial services and the rehabilitation of survivors with physical and/or psychological problems. Live videoconferencing was subsequently established to link the Bangkok center with the local center at Suan Saranrom Hospital.

The Mental Health Center for Thai Tsunami Disaster formed 8 mobile mental health teams to evaluate mental health status of the affected population and to deliver appropriate interventions, including counseling and referrals to specialist facilities. Three teams were immediately dispatched to Phang Nga, and 1 team each to Krabi, Ranong, Phuket, Trang, and Satun. Each team consisted of 1 or 2 psychiatrists, 2 or 3 psychologists, 1 social worker, 2 or 3 psychiatric nurses, a pharmacist, a patient caregiver, and a driver. Teams reported daily to MHCT in order to facilitate needs analysis and planning.

The Department of Mental Health helped to increase awareness of MHCT activities by promoting its activities through different media channels, including television, Internet, and print media. The Mental Health Technical Development Bureau organized training sessions to deliver basic psychological education to teachers, parents, public health staff, and volunteers. Currently, the Department of Mental Health is planning long-term strategies for the rehabilitation of tsunami survivors.

India

Ramadurai Mani, M.B., B.S., Junior Consultant, Department of Psychiatry, Voluntary Health Services, Chennai–113, Tamil Nadu, India.

Coastal fishing communities along the eastern coastline of India bore the brunt of the tsunami (Figure 3). The few assets that these economically self-sufficient communities possessed before the disaster, such as fishing boats, schools, and villages, were largely destroyed. In the immediate aftermath, inadequate roads and lack of basic infrastructure hampered access to these areas, and telecommunications were also severely compromised.

Children were the most affected sector of the population, with many losing both parents and needing immediate support from surviving relatives such as grandparents. People with a prior psychiatric history were also vulnerable, with many experiencing exacerbations due to loss of medicines. In the postdisaster environment, voluntary health services offered some relief to the affected population. The Schizophrenia Research Foundation (SCARF) in Chennai conducted training programs for mental health volunteers in psychological symptoms and intervention techniques for managing psychological distress. Regular follow-up of affected villages was conducted with the assistance of nongovernmental organizations. Psychiatric clinics were held in severely affected areas and were bolstered by permanent field staff that conducted house visits and collected survey data for future planning initiatives.

A leading suicide prevention center, SNEHA, was established in Srinivasapuram, one of the coastal areas of Chennai. Two professional psychologists and a volunteer began daily visits to screen survivors for posttraumatic stress disorder, depression, substance abuse, and other psychiatric and psychosocial problems. Those diagnosed with mental illness were referred to voluntary health services in Chennai for psychotropic medication and hospitalization if needed. The Institute of Mental Health in Chennai organized psychiatric camps to screen for mental illness and provide treatment for people in the Tamil Nadu region.

Following the acute phase of the disaster response, the incidence of posttraumatic stress disorder has been slowly increasing, not only among people living in coastal areas of India but also among members of the wider community who were exposed to graphic images of the disaster in the media. Nonavailability of psychotropic medications, including antidepressants and antipsychotics, continues to compound the difficulties experienced by disaster survivors. Uneven distribution of relief supplies has resulted in considerable resentment and frustration among those affected, while migration of people from the tsunami-affected areas has resulted in overcrowding, epidemic and isolated infectious disease outbreaks, and psychosocial problems. Many survivors continue to experience fear and are unable to reclaim their old lives due to ongoing fear of a repeat event.

Sri Lanka

Chandanie Hewage, M.D., Head, Department of Psychiatry, Faculty of Medicine, University of Ruhuna, Galle, Sri Lanka.

In the aftermath of the tsunami that struck the eastern and southern coastlines of Sri Lanka (Figure 4), an estimated 50,000 people were dead or missing, more than 1 million people were displaced, and property damage was massive and widespread. During the first 2 days, most people were overwhelmed with the shock and enormity of the tsunami's impact. While efforts were made to assist those in need, such efforts were not coordinated and made little real difference. Affected areas were cut off from the rest of the country due to disruption of communication systems and roads, limiting the supply of outside support.

Within days, governmental and nongovernmental organizations as well as volunteers began attending to emergency needs: rescue and recovery; giving medical attention to the sick and injured; providing shelter, food, and other basic needs; collecting, identifying, and storing bodies; restoring communication systems; implementing disease-

Figure 3. Map of the Tsunami-Affected Coastal Provinces of India[a]

[a]Adapted with permission from Compare Infobase Pvt. Ltd. (www.infobase.co.in).

prevention measures; and facilitating access to affected areas to allow the delivery of relief supplies. At the same time, health authorities and mental health professionals began to identify the psychosocial needs of the affected population and initiated psychosocial support services.

During the acute phase of the disaster recovery, immediate mental health needs included resources for early detection of acute psychoses, the provision of drugs for relapse prevention among individuals with preexisting mental health disorders, and the training of mental health workers and volunteers in basic psychological first aid in order to extend existing mental health services. Typical barriers to service delivery included loss of patient medical files, lack of awareness among patients of their medications, lack of an efficient central record keeping system, and inadequate numbers of trained mental health professionals.

The acute phase of recovery was a problem-solving exercise. Drug display cards were developed to assist patients and mental health outreach services. Training programs were conducted for mental health workers providing different levels of care, and psychiatrists from unaffected areas were recruited to assist with demands on mental health services. Information leaflets were prepared and distributed in order to educate the public about typical psychological and behavioral responses, and media personnel were briefed about the appropriate use of disaster images and public education initiatives. Religious leaders and traditional health care practitioners were encouraged to become involved in psychosocial support, while trainee doctors were called in to strengthen primary health care services. Volunteers were given training and sent out into the communities to assist with resettlement issues. In training programs for psychosocial support workers, special attention was given to the needs of children. Special referral systems were initiated to address psychological and psychiatric problems detected by support workers in the community.

Beyond the pressing acute needs of mental health service delivery, the provision of psychosocial support at a community level and prevention of staff burnout were identified as intermediate needs. Before the disaster, community-based mental health services were limited and primary health care personnel had little training in mental health. Many were themselves victims of the tsunami and

Figure 4. Map of the Tsunami-Affected Coastal Divisions of Sri Lanka[a]

[a]Adapted with permission from the Cartography Division, Department of Census and Statistics–Sri Lanka (www.statistics.gov.lk).

were burdened with childcare and care-giving activities, necessitating the training of new mental health workers.

Long-term needs include the prevention of late-onset psychological problems, the strengthening of mental health and other community-based services, the provision of ongoing supervision and training of staff in all sectors, and research. Future planning activities need to reflect key issues of human resource and infrastructural adequacy in mental health and the coordination of psychosocial activities.

SUMMARY

The Asian tsunami serves as a potent reminder of the need to engage mental health services in a primary care setting before disaster occurs, in order to achieve the greatest benefit when disaster does strike. This approach requires the identification of resources and personnel, appropriate training and ongoing support, and strategies to safeguard these gains against health policy changes. The faculty anticipates that this supplementary publication of the proceedings will assist not only those addressing the long-term effects of the tsunami in affected countries of South Asia, but also those involved in planning for future disasters, irrespective of their location. It is hoped that the contents of this monograph may also be of relevance and benefit to those who are currently involved in assisting the recovery efforts following Hurricane Katrina, which produced such massive destruction in the southern United States.

Disclosure of off-label usage: The author has determined that, to the best of his knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling has been presented in this article.

The Extent and Impact of Mental Health Problems After Disaster

Jonathan R. T. Davidson, M.D., and Alexander C. McFarlane, M.D.

Disasters are events that challenge the individual's ability to adapt, which carries the risk of adverse mental health outcomes including serious posttraumatic psychopathologies. While risk is related to degree of exposure to psychological toxins, the unique vulnerabilities of special populations within the affected community as well as secondary stressors play an important role in determining the nature and amount of morbidity. Disasters in developing countries and those associated with substantial community destruction are associated with worse outcome. Although acute responses are ubiquitous, few disasters lead to posttraumatic psychopathology in the majority of people exposed. However, the shortage of human resources in psychiatry, particularly in developing countries, places a considerable burden on psychiatric services even without the additional constraints imposed by disaster. Hence, disasters are events that invite a public health approach to mental health that better serves the needs of the individual and the affected community. Such an approach considers all available human resources and is intended to mitigate the effects of disaster before serious psychopathologic sequelae arise. This community mental health strategy allows peripheral mental health workers to mediate between survivors and specialized mental health professionals while assisting in removing barriers to treatment. To be effective when disaster occurs, this approach requires careful planning in conjunction with community consultation before implementation of formal disaster mitigation policies.

(J Clin Psychiatry 2006;67[suppl 2]:9–14)

Disasters are events that collectively have been distinguished from other types of potentially traumatic events by applying a definition of "massive collective stress" or "violent encounters with nature, technology, or humankind." [1,2] Regardless of their scale and consequent likelihood of media reportage, disasters are regular occurrences, with one estimate placing their frequency at an average of 1 per day somewhere throughout the world.[3] Whether by earthquake or tsunami, nuclear mishap or transportation incident, mass shooting or bombing attack, disasters have in common a collective social suffering that requires a supreme effort by individuals, communities, and even entire societies to overcome. They are events that challenge the individual's capacity for adaptation, which can lead to the onset of a range of adverse mental health outcomes, including serious posttraumatic psychopathologies. These may often persist for a very long time after the event[4,5] and represent a further burden to individuals whose physical and emotional resources have already been depleted by their losses.

Disasters are events with predictable long-term consequences. In general terms, the degree of exposure to a disaster determines risk and level of psychological morbidity,[6,7] although biological, social, and economic factors may all be determinants of vulnerability in special populations.[8,9] While the nature of losses and their documented effects is dependent on the nature of the disaster, individual stressors such as destruction of the family home, bereavement, threat to life, physical injuries, and the individual's behavior during the disaster can all be viewed as "psychological toxins" whose effects are greatest with increasing proximity to the event.[10,11] Moreover, there is evidence that individual loss and community destruction are interrelated, with worse outcomes associated with those individuals who come from communities with a high level of destruction and who suffered high levels of personal loss.[12]

The ample provision of mental health resources is a challenge for all countries, but particularly so in developing countries where the supply of sufficient human resources in mental health is an unmet need.[13] Enhancing the level of service is a health priority at the best of times, but

From the Department of Psychiatry and Behavioral Science, Duke University Medical Center, Durham, N.C. (Dr. Davidson); and the University of Adelaide, Department of Psychiatry, Level 1 Maternity Wing, Queen Elizabeth Hospital, Woodville, Australia (Dr. McFarlane).

Presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and supported by an educational grant from Pfizer Inc.

Corresponding author and reprints: Jonathan R. T. Davidson, M.D., Department of Psychiatry and Behavioral Science, Duke University Medical Center, Durham, NC 27710 (e-mail: jonathan.davidson@duke.edu).

in a crisis situation brought on by disaster there is an urgent need to engage existing services with strategies to extend mental health care. For this reason, disasters are events that invite a public health approach in the mental health setting that is conducive to the development and implementation of strategies that serve the needs both of the individual and of the community. By considering the likely impact of a disaster on mental health, it is anticipated that health-care workers, policy makers, and others involved in the delivery of mental health care will be better engaged in both planning and mitigation strategies.

PSYCHIATRIC RESPONSES TO MASS TRAUMA

The potential effects of a disaster on the mental health of the affected population are highly variable, ranging from minimal and fleeting to severe psychological distress or impairment that may persist for many years after the event.[3] During the minutes and hours that follow a potentially traumatic event, acute reactions are ubiquitous and unstable and typically involve any or all of anxiety, depression, agitation, anger, despair, shock, withdrawal, hyperactivity, conversion, and dissociation.[14] Within a few days and as early as 1 day after exposure, these initial acute responses are replaced with symptoms resembling those of posttraumatic stress disorder (PTSD) and depression, with almost all survivors expressing some symptoms of PTSD in particular.

The almost universal expression of PTSD symptoms, combined with social acceptability of these types of responses (i.e., they effectively communicate a need for help) and the observation that some forms of early intervention are harmful, indicates that there is an element of adaptation involved as the individual moves from survival mode to adjusting to the novelty that accompanies a potentially traumatic event. While such responses can be distressing and transiently disabling, they are seldom associated with gross disorganization or confusion. Acute responses tend to be self-limiting and subside in most cases without deliberate intervention.[14]

In some survivors, the early responses are not accompanied by learning and adaptation, or they fail to remit, and are a prelude to serious mental disorders. Therefore, while most survivors will demonstrate symptoms of intrusive recall, anguish, and social withdrawal in line with their experiences of fear, loss, and processing novelty, severely traumatized survivors additionally describe a sense of profound transformation, dysphoria, irritability, a loss of security, poor-quality sleep, disharmony with others, social isolation, and an inability to share inner experiences.[14]

According to the World Health Organization (WHO), psychological maladaptation to the stress of disaster includes mild, moderate, and severe forms of mental disorder and psychological distress.[15] The WHO estimates that in the general population worldwide, the baseline prevalences of mild-to-moderate and severe mental disorder are around 10% and 2% to 3%, respectively. The WHO estimates that after disaster the general overall prevalence rates for mild-to-moderate and severe mental disorder are liable to increase to 20% and 3% to 4% of the affected population, respectively. As noted below, these rates may be higher in the population affected by the Asian tsunami.

Most disasters yield at least moderate psychological impairment of the affected population. In a seminal contribution to the literature on mental health in disaster, Norris et al.[3] reviewed English-language studies published between 1981 and 2001 of 102 natural, technological, or violent disasters affecting more than 60,000 individuals in 29 countries. From a sample of 160 disaster victims, the investigators identified a range of outcomes categorized in order of frequency as specific psychological problems, nonspecific distress, health problems, chronic problems in living, resource loss, and problems specific to youth. Youth-associated problems vary with age and among younger children include increased dependency, aggressive behavior, hyperactivity, and separation anxiety, while in adolescents there may be elevations in behaviors normally associated with this age group as well as deviant and delinquent behaviors.

Specific psychological problems, identified in 74% of the sample, represent the set of outcomes most closely corresponding to mental disorders as defined by the WHO. These incorporate symptoms of posttraumatic stress, depression, anxiety, and other psychiatric problems, as well as specific conditions of PTSD, major depressive disorder (MDD), generalized anxiety disorder, and panic disorder. Minimal or moderate impairment indicative of prolonged stress was observed in 61% of individuals, and severe or very severe impairment, in 29% of individuals. In general terms, severe and very severe impairment tended to be associated with disasters involving mass violence, whereas the majority of natural disasters were associated with moderate impairment.

Of the specific psychological problems reported among survivors of a disaster, PTSD is typically the most commonly identified condition.[3] While PTSD is undeniably prevalent in the disaster setting and has received considerable attention in the literature, its rate is dependent on the sampling used in a study as well as the nature and severity of the event.[16] Knowledge of the likely impact of PTSD is useful in terms of treatment priorities and resource allocation, but there is also a need to adequately consider the importance of other psychopathologies, with depression and anxiety disorders observed in 37% and 20%, respectively, of disaster survivors evaluated by Norris et al.[3] Major depressive disorder is a distinct and frequently comorbid diagnosis. To date, the focus on PTSD has perhaps led to an underestimate of the importance of depression as a source of morbidity, particularly in populations in which there are major levels of loss that have an enduring effect. The demoralization that can follow in the wake of the

prolonged hardships after a disaster is an important contributor to vulnerability to depression.

Among those affected by the Asian tsunami, the WHO estimates the likely prevalence of psychological distress to be on the order of 50% to 90% among the affected populations, with approximately 20% to 40% expected to suffer mild distress and 30% to 50% expected to suffer moderate-to-severe distress.[15] The corresponding set of outcomes of nonspecific distress identified by Norris et al.[3] in 39% of sample populations includes nonsyndromic, stress-related psychological and psychosomatic symptoms, including symptoms of anxiety and depression. These and other outcomes of disaster, including concomitant problems relating to general health, chronic problems in living attributable to secondary stressors, and depletion of psychosocial resources, reflect the collective experience of survivors of disaster and may modulate outcomes not only for the individual, but also for the community.

ACUTE EXPRESSION OF POSTTRAUMATIC PSYCHOPATHOLOGY

Psychological Morbidity

Although the stable expression of acute symptoms of PTSD over time may have a small predictive component in terms of subsequent morbidity, the presence of early symptoms in both survivors who recover and those who do not limits any real predictive value of these symptoms.[14] The predictive ability of risk factors is, therefore, not high, and an overemphasis of predisaster characteristics will tend to underestimate the importance of the severity of exposure. However, during the early recovery period when survivors begin to assimilate their experiences, few do well with distancing themselves from the event, and most will experience repeated and vivid intrusive thoughts and images. Negative appraisal of these early symptoms increases the likelihood of subsequent morbidity.

The epidemiologic research into the impact of disasters has consistently demonstrated that there are few events that lead to posttraumatic psychopathology in the majority of people exposed.[16] While comparison between studies of mental health outcomes in disaster is difficult owing to the variability of sampling processes, it is apparent that the intensity of exposure experienced by the population studied has a major impact on the prevalence of disorders.[6,7] Closer proximity to the event may also impact the duration of symptoms.[17] Disasters causing severe, lasting, and pervasive psychological effects are characterized by at least 2 of the following: a high prevalence of injury, threat to or actual loss of life; extreme and widespread property damage; serious, ongoing financial problems for the affected community; and involvement of human carelessness or intent.[3] Therefore, perception of life threat, injuries to the individual or family members, bereavement, destruction of the family home, loss of possessions, and associated loss of sense of identity and social integration can all be considered as "psychological toxins" and as such are risk factors for psychological morbidity, determined in part by the degree of exposure, which in itself is also a critical determinant of the level of psychological morbidity.[10,11,16]

An understanding of potential vulnerability and protective factors, in addition to the degree of exposure, is necessary to explain much of the probability of developing post-disaster psychological morbidity, which is a product not only of the environment in which the disaster occurred, but also of the context of the event in the individual's experience, with the latter serving as a base from which the disorder emerges.[14] In a meta-analysis of risk factors for PTSD in adults exposed to trauma, posttrauma characteristics of trauma severity, lack of social support, and additional life stress had a stronger predictive effect for PTSD than pretrauma characteristics.[6] Pretrauma characteristics were far from exempt in terms of having a predictive value and were categorized according to consistency of their predictive value. Therefore, gender, age at trauma, and ethnicity predicted PTSD in some, but not all, populations. Education, previous trauma, and general childhood adversity predicted PTSD somewhat more consistently, while reported childhood abuse and prior or family psychiatric history had a more uniform predictive value.

Similarly, Norris et al.[3] observed that, among adult samples, posttrauma characteristics of exposure severity, inadequate psychosocial resources, and secondary stressors and pretrauma characteristics of female gender, middle age, ethnic minority status, and prior psychiatric history increased the likelihood of an adverse outcome. Among samples of youth, who represent an at-risk population for severe impairment, supportiveness of family environment and level of parental distress were predictive of outcome.

Other Presenting Symptoms

Other symptoms arising from the primary disaster experience may also determine in part the occurrence of posttraumatic psychopathology. Somatic complaints such as headaches, musculoskeletal pains, and fatigue are common idioms of distress in the aftermath of disaster. The significance of these complaints is frequently overlooked in primary care settings[18] (for additional information on this subject, see Foa et al., this supplement). Increased alcohol consumption and drug abuse are typically overexpressed in disaster victims relative to control populations.[3] Secondary stressors arising from chronic problems in living, such as troubled interpersonal relationships, financial worries, intercurrent adversity (e.g., the separatist movements in Indonesia and Sri Lanka), lawlessness, threat of epidemic disease, conflict over disaster relief, inequity in distribution of resources, and continued disruption of social infrastructure, are also more abundant in disaster survivors relative to control populations and may mediate the effects of acute response and chronic psychological outcomes.

LONG-TERM CONSEQUENCES OF MASS TRAUMA

Within most populations affected by disaster, postdisaster symptomatology improves over time.[3] Longitudinal data show, in general, that symptoms reach peak severity during the first year, which is followed by a recovery period marked by a gradual decline in symptoms.[3] In variant patterns, symptoms may peak then initially decline before stabilizing, or stabilize before beginning a new downward trend. Quadratic and cyclical patterns have also been reported, as have late-developing symptoms and symptom progression and persistence. Few people reaching a peak of severity in the first year will spontaneously present for treatment, and for many there is a long delay before seeking assistance. Many postdisaster intervention organizations fail to anticipate this delay and prematurely withdraw services.[19]

Estimates of psychological symptoms in disaster cohorts based on point prevalence data, and longitudinal and follow-up studies are helpful in assessing survivor needs in the months and years following disaster and provide a picture of the variance that is associated with symptom acquisition, recovery, and persistent psychopathology. Following the 1988 Yun Nan earthquake in China, the prevalence of PTSD at 5 months in communities experiencing major, intermediate, or mild damage was 23%, 13%, and 16%, respectively. The respective prevalence rates of disaster-specific PTSD were 13.5%, 6.2%, and 7.1%, respectively, while for the overall group exposed to the earthquake, the estimated prevalence was 8.9%.[20] Among survivors of the Oklahoma City bombing, rates of PTSD, MDD, and panic disorder at 6 months were 34.3%, 22.5%, and 6.6%, respectively, with 15% of the sample having experienced PTSD prior to the event.[21] Disaster victims affected by Mexico's 1999 flood were still experiencing PTSD 2 years later, with rates of PTSD at 1 year and 2 years postdisaster estimated at 24% and 11%, respectively.[22]

A longitudinal study of psychological morbidity in school-aged children exposed to a bushfire disaster found that symptoms at 2 months after exposure were actually lower than those of a control group.[23] However, symptoms increased over the next few months before stabilizing such that psychological morbidity was as great at 26 months postdisaster as at 8 months. Firefighters exposed to the same disaster had a rate of PTSD of 16%, with about half of the sufferers experiencing remission at 42 months.[24] Victims of the Buffalo Creek dam burst of 1972 had a lifetime PTSD rate of 59%, with 25% still meeting PTSD criteria some 14 years after the event.[25]

Two further follow-up studies[4,5] illustrate the potential for ongoing morbidity long after the event. One, a study of survivors of the Piper Alpha oil platform collapse, found that 21% of survivors met the criteria for PTSD over 10 years after the event.[4] The second, a follow-up study of survivors exposed to trauma in childhood, observed a PTSD rate of 46% at some point postdisaster, while 29% met the criteria for PTSD 33 years after the event.[5] Finally, the National Comorbidity Survey of the general population indicated that of those individuals with PTSD, approximately 60% would be in remission by 5 years, but in those people who continued to experience symptoms at this time, the disorder was likely to run a protracted course.[26]

IMPACT ON COMMUNITIES

Although there is a paucity of data concerning the possible interaction between community destruction and individual exposures, there is a strong suggestion that collective community losses, such as the destruction of infrastructure, loss of essential services, and potential displacement of large numbers of people, contribute to disaster outcomes.[12,27] Those individuals with poorer outcomes came from communities with a high level of destruction and had high levels of personal loss.[3,12] The impact of community losses on psychological well-being of individuals appears to differ from that of personal losses, in that community destruction is more closely correlated with decreasing positive influences, whereas personal losses are associated with increasing negative effects.[3] Under normal circumstances, communities provide a hub of psychosocial resources that contribute to well-being. Deficits in these resources as a result of disaster diminish self-reliance and optimism and may mediate the effects of acute psychological responses, further influencing outcome. Moreover, rebuilding the community can be difficult when a large proportion of its residents are affected by mental disorders,[22] which is further compounded when existing mental health resources are scarce at the time of disaster or diminishing as a result of disaster.[13] In this regard, disasters occurring in developing countries tend to cause greater impairment than those in developed countries.[28]

DELIVERY OF MENTAL HEALTH CARE

According to the World Health Report 2003,[29] the most critical issue facing health-care systems throughout the world, and especially those of developing countries, is the shortage of human resources. The report recognizes that all countries are part of a global marketplace competing for the same human resources, with the inevitable net trade of health professionals moving in the direction of developed countries and in the process creating a demand-supply imbalance. The challenge of providing sufficient numbers of mental health professionals in developing countries is an especially large one, which has brought about a reevaluation of how to manage the problem.

Murthy[13] has observed that the shortage of specialist personnel in countries such as India is an opportunity to organize the mental health care systems of developing countries around community-based resources, with a resulting shift from service provision by relatively few

specialists to a wide range of mental health providers. Such an approach is facilitated in 4 key areas: modifying the curriculum within undergraduate medical education to incorporate practical training in psychiatry; developing short training programs that emphasize clinical and practical aspects of mental health for nonspecialists, including medical officers, psychologists, social workers and nurses; using a wide variety of nonprofessionals, including volunteers involved in suicide prevention, patients functioning as therapists in community programs such as Alcoholics Anonymous, and family members adopting a therapy role for other family members; and involving staff in other sectors, such as schoolteachers, the police, and religious leaders. In this way, mental health care becomes "piggybacked" onto community health care, rather than acting as a stand-alone system with accessibility for few.

The WHO has already conducted large-scale testing of a policy of devolving mental health care to less specialized personnel, which has the strategic goal of amplifying human resources in the mental health setting through appropriately tailored, cost-effective training.[30] Within the medical profession, this policy involves developing the clinical component of the undergraduate curriculum and linking medical training in psychiatry with national mental health programs. By far the largest element of the policy is concerned with extending psychiatric training to nonspecialist allied health professionals and workers and volunteers outside the healthcare sector. In India, such nonspecialist workers have greatly extended the mental health care resources available with the advantage that these typically indigenous workers and volunteers approach mental health problems with a firsthand understanding of local culture.[13,30]

Peripheral workers are additionally well placed to mediate between survivors struggling to cope with the effects of disaster and scarce specialized staff while helping to break down barriers to treatment. Such barriers to the delivery of mental health care, unlike barriers to general health care delivery, are found universally in developing and developed countries alike and contribute to a low uptake of care for reasons of stigma, distrust, and absence of acknowledgment of impairment, cultural sensitivity, and cultural relevance.[31] As well as helping to break down barriers in developing countries, the strategy discussed also has relevance in developed countries, as was demonstrated in a U.K. study[4] of survivors of the Piper Alpha oil rig disaster. Informal support groups and networking encouraged positive outcomes among survivors of this disaster.[4] The implication of this and other findings is that community-based and nonprofessional support systems are just as important as professional care, but work best when the 2 approaches coexist.

PLANNING FOR DISASTER: LESSONS FROM HISTORY

History has demonstrated a reluctance among the mental health community and the broader community at large to retain experience and knowledge about the impact of trauma associated with disaster. Disaster research has played an invaluable role in correcting this situation by assessing morbidity and highlighting the long-term effects of these events, which in the past tended to be overlooked in disaster planning. The challenge for the mental health community now is not only to react to a disaster situation by extending treatment to those affected and exploring outcomes in depth with ongoing research, but also to help combine the lessons learned from previous disasters into plans for future disaster management.[16]

The positive aspect of data on risk is that many of the secondary stressors underlying chronic problems of survival in the postdisaster environment are amenable to social interventions, which appear to be critical to recovery.[6] An illustration of this principle is provided by Goenjian,[32] who described the implementation and outcomes of a mental health relief program in Armenia following the 1988 Spitak earthquake. In the aftermath, the government of the time promised to rebuild the devastated city, but 2 years later the promise remained unfulfilled, which potentially correlated with survivors' symptoms and particularly with the high prevalence, marked severity, and protracted duration of posttraumatic stress. In Goenjian's interpretation, a modifiable, but unmodified, secondary stressor compromised survivors' capacities to adapt after disaster.[32]

The mental health delivery system in place at the time of the Spitak disaster was ill-equipped to deal with the needs of traumatized victims: outpatient mental health clinics were virtually nonexistent, psychologists were predominantly involved in teaching and research and were not certified to provide treatment, there were no trained counselors or social workers to provide primary psychosocial care, and available treatment modalities were not conducive to treating large numbers of people. On a positive note, however, a psychiatric outreach program was subsequently implemented to provide psychological first aid, establish mental health outpatient clinics, train local therapists and teachers, who in turn provided mental health support to victims, and advise local government and relief officials in regard to relief priorities. The range of treatment modalities was expanded to include exploratory, supportive, and educational measures, and interventions were planned to minimize symptom progression and prevent the development of maladaptive behavior. The outcomes from these basic interventions were highly beneficial, with disaster victims involved in treatment reporting improvement in sleep disturbances, social isolation, and regressive symptoms among children. In comparison, recurrent intrusive symptoms and hyperarousal were more resistant to treatment. Family and group therapies benefited not only those receiving treatment but also other families by providing a supportive network that had a positive ripple effect.

Capacity building activities and initiatives to define community vulnerability and strengths are crucial for the

strategic development of disaster preparedness.[33] Identification of special populations, such as women, ethnic minorities, and the marginalized and impoverished, is an important step not only in identifying those individuals and groups within a society that are at increased risk of a poor outcome in the event of disaster, but also in having their needs and views represented during disaster planning.[8] Finally, the experience in India following the 2001 Gujarat earthquake was that disaster relief would have been more effective if the following had been given adequate consideration: development of proper public health indicators to assess the status of public health care and provide indicators of the nature and amount of relief required in the event of disaster; development of effective, centralized, and localized coordination abilities for assigning relief supplies and services; acquisition of agreement on distribution of relief prior to disaster to avoid delays caused by bureaucracy; and development of policy on disaster relief.[33]

CONCLUDING REMARKS

From a policy perspective, countries and individual communities need to anticipate and prepare for disaster and its associated psychiatric morbidities. No one set of recommendations would be appropriate given the often considerable variation in disaster impact, which is based not only on the nature and intensity of the disaster itself, but also on the unique vulnerabilities of special populations within affected communities. Rather, each new disaster should be considered as a novel event with predictions about rates of morbidity and associated mental health needs of the affected population based on considered and planned disaster mitigation activities. It is critical that the activities match the cultural context and needs of the victims, which is best ensured by involving the community in evaluating its own needs and determining which activities are most appropriate.

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration-approved labeling has been presented in this article.

REFERENCES

1. Kinston W, Rosser R. Disaster: effect on medical and physical state. J Psychosom Res 1974;18:437–456
2. Norris F. Epidemiology of trauma: frequency and impact of different potentially traumatic events on different demographic groups. J Consult Clin Psychol 1992;60:409–418
3. Norris FH, Friedman MJ, Watson PJ, et al. 60,000 disaster victims speak, pt 1: an empirical review of the empirical literature, 1981–2001. Psychiatry 2002;65:207–239
4. Hull AM, Alexander DA, Klein S. Survivors of the Piper Alpha oil platform disaster: long-term follow-up study. Br J Psychiatry 2002; 181:433–438
5. Morgan L, Scourfield J, Williams D, et al. The Aberfan disaster: 33-year follow-up of survivors. Br J Psychiatry 2003;182:532–536
6. Brewin CR, Andrews B, Valentine JD. Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. J Consult Clin Psychol 2000;68:748–766
7. Carlier I, Gersons B. Stress reactions in disaster victims following the Bijlmermeer plane crash. J Traumatic Stress 1997;10:329–335
8. Morrow BH. Identifying and mapping community vulnerability. Disasters 1999;23:1–18
9. Hutton D, Haque CE. Human vulnerability, dislocation and resettlement: adaptation processes of riverbank erosion-induced displacees in Bangladesh. Disasters 2004;28:41–62
10. Briere J, Elliott D. Prevalence, characteristics and long-term sequelae of natural disaster exposure in the general population. J Trauma Stress 2000;13:661–679
11. Bravo M, Rubio-Stipec M, Canino G, et al. The psychological sequelae of disaster stress prospectively and retrospectively evaluated. Am J Commun Psychol 1990;18:661–680
12. Phifer J, Norris F. Psychological symptoms in older subjects following natural disasters: nature, timing and duration in course. J Gerontol 1989; 44:207–217
13. Murthy RS. Human resources for mental health: challenges and opportunities in developing countries. Int Psychiatry 2005;Jan:5–7
14. Shalev AY. Acute stress reactions in adults. Biol Psychiatry 2002;51: 532–543
15. World Health Organization. Mental Health Assistance to the Populations Affected by the Tsunami in Asia. Available at: http://www.who.int/mental_health/resources/tsunami/en/print.html. Accessed July 6, 2005
16. McFarlane AC. Psychiatric morbidity following disasters: epidemiology, risk and protective factors. In: Lopez-Ibor JJ, George C, Maj M, et al, eds. Disasters and Mental Health. Geneva, Switzerland: World Health Organization; 2004:37–63
17. Weisaeth L. The stressors and the post-traumatic stress syndrome after an industrial disaster. Acta Psychiatr Scand 1989;80(suppl 355):25–37
18. McFarlane A, Atchison M, Rafalowicz E, et al. Physical symptoms in post-traumatic stress disorder. J Psychosom Res 1994;38:715–726
19. McFarlane AC. Post-traumatic morbidity of a disaster: a study of cases presenting for psychiatric treatment. J Nerv Ment Dis 1986;174:4–14
20. Cao H, McFarlane AC, Klimidis S. Prevalence of psychiatric disorder following the 1988 Yun Nan (China) earthquake: the first 5-month period. Soc Psychiatry Psychiatr Epidemiol 2003;38:204–212
21. North CS, Nixon SJ, Shariat S, et al. Psychiatric disorders among survivors of the Oklahoma City bombing. JAMA 1999;282:755–762
22. Norris FH, Murphy AD, Baker CK, et al. Postdisaster PTSD over four waves of a panel study of Mexico's 1999 flood. J Trauma Stress 2004; 17:283–292
23. McFarlane AC, Policansky SK, Irwin C. A longitudinal study of the psychological morbidity in children due to a natural disaster. Psychol Med 1987;17:727–738
24. McFarlane AC, Papay P. Multiple diagnoses in posttraumatic stress disorder in the victims of a natural disaster. J Nerv Ment Dis 1992;180: 498–504
25. Green BL. Traumatic stress and disaster: mental health effects and factors influencing adaptation. In: Lieh-Mak F, Nadelson CC, eds. International Review of Psychiatry, vol. 2. Washington, DC: American Psychiatric Press; 1996:177–210
26. Kessler RC, Sonnega A, Bromet E, et al. Posttraumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 1995;52: 1048–1060
27. McFarlane AC, Cao H. The study of a major disaster in the People's Republic of China: the Yunnan earthquake. In: Raphael B, Wilson J, eds. The International Handbook of Traumatic Stress Syndromes. New York, NY: Plenum; 1993:493–498
28. Norris FH, Friedman MJ, Watson PJ. 60,000 disaster victims speak, pt 2: summary and implications of the disaster mental health research. Psychiatry 2002;65:240–260
29. World Health Organization. The World Health Report 2003. Geneva, Switzerland: World Health Organization; 2003
30. Murthy RS, Wig NN. The WHO collaborative study on strategies for extending mental health care, 4: a training approach to enhancing the availability of mental health manpower in a developing country. Am J Psychiatry 1983;140:1486–1490
31. El-Islam MF. Some cultural aspects of the Arab patient-doctor relationship. Bulletin of the Board of International Affairs of the Royal College of Psychiatrists 2005;7:18–20
32. Goenjian A. A mental health relief program in Armenia after the 1988 earthquake: implementation and clinical observations. Br J Psychiatry 1993;163:230–239
33. Bremer R. Policy development in disaster preparedness and management: lessons learned from the January 2001 earthquake in Gujarat, India. Prehospital Disaster Med 2004;18:372–384

Symptomatology and Psychopathology of Mental Health Problems After Disaster

Edna B. Foa, Ph.D.; Dan J. Stein, M.D., Ph.D.; and Alexander C. McFarlane, M.D.

A variety of reactions are observed after a major trauma. In the majority of cases these resolve without any long-term consequences. In a significant proportion of individuals, however, recovery may be impaired, leading to long-term pathological disturbances. The most common of these is posttraumatic stress disorder (PTSD), which is characterized by symptoms of reexperiencing the trauma, avoidance and numbing, and hyperarousal. A range of other disorders may also be seen after trauma, and there is considerable overlap between PTSD symptoms and several other psychiatric conditions. Risk factors for PTSD include severe exposure to the trauma, female sex, low socioeconomic status, and a history of psychiatric illness. Although PTSD may resolve in the majority of cases, in some cases risk factors outweigh protective factors, and symptoms may persist for many years. PTSD often coexists with other psychiatric disorders, such as depression, anxiety disorders, and substance abuse, and with physical (somatization) symptoms. There is growing evidence that PTSD does not merely represent a normal response to stress, but rather is mediated by specific neurobiological dysfunctions.
(J Clin Psychiatry 2006;67[suppl 2]:15–25)

Acute stress reactions are a normal and expected response to a traumatic event, seen in the majority of cases. Nevertheless, pathologic persistence of symptoms, or posttraumatic stress disorder (PTSD), is seen in a minority of cases. The development of PTSD depends on complex interrelationships between the nature of the trauma itself, the characteristics of the victim, and the social circumstances and support networks available to the victim. In each case, however, a central feature is the formation of a traumatic memory of the event.[1,2] The challenges therefore are to understand the defining features of the event that form the basis of this traumatic memory and the factors that influence how the traumatic memory is subsequently manifested as acute and chronic illnesses.

This article reviews the symptomatology and psychopathology of major trauma experienced by disaster victims.

From the Center for the Treatment and Study of Anxiety, Department of Psychiatry, University of Pennsylvania, Philadelphia (Dr. Foa); the Department of Psychiatry, University of Cape Town, Cape Town, South Africa (Dr. Stein); and the University of Adelaide, Department of Psychiatry, Queen Elizabeth Hospital, Woodville, Australia (Dr. McFarlane).

Presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and supported by an educational grant from Pfizer Inc.

Corresponding author and reprints: Edna B. Foa, Ph.D., Center for the Treatment and Study of Anxiety, Department of Psychiatry, University of Pennsylvania, 3535 Market Street, 6th Floor, Philadelphia, PA (e-mail: foa@mail.med.upenn.edu).

POSTTRAUMATIC PSYCHOPATHOLOGY

A variety of reactions may be observed after a major trauma. The precise combination of reactions that is observed depends on numerous factors, including the severity and intensity of the initial trauma, the duration of exposure, and the individual characteristics and social circumstances of the survivor. These predictors will be discussed in more detail (see The Sequential Etiological Process Leading to PTSD and Its Predictors).

In a review of 160 studies of disaster victims, Norris et al.[3] identified 6 discrete groups of outcomes following major trauma: specific psychological disorders such as PTSD, depression, or anxiety; nonspecific distress; health problems; chronic problems in living; resource loss; and problems specific to youth (Table 1). Overall, 77% of the studies identified specific psychological disorders such as PTSD, major depressive disorder (MDD), or anxiety, including generalized anxiety disorder (GAD) and panic disorder. PTSD was the most commonly observed disorder, being identified in 68% of studies, followed by depression in 36% and anxiety in 20%. In addition, health-related problems such as somatic complaints, sleep disturbances, and substance abuse were reported in 23% of studies.

Initial psychological reactions to trauma may include feelings of fear, horror, or helplessness (symptoms essential for the diagnosis of PTSD; see Symptoms of PTSD). Sometimes, individuals struggle to find the language to express the overwhelming emotion that is experienced and will use words such as "shock," "unbelievable," or "im-

Table 1. Outcomes Following Major Trauma[a]

Specific psychological problems
Posttraumatic stress
Depression
Anxiety (including generalized anxiety disorder and panic disorder)
Nonspecific distress
Health problems
Somatic complaints
Sleep disturbances
Alcohol or other substance abuse
Problems in living
Interpersonal relationships
Occupational or financial stress
Environmental concerns
Disruption during rebuilding
Resource loss
Disruption of family and other social networks
Decreased social participation
Problems related to youth
Clinginess, dependence, aggression, etc, in young children
Delinquency in adolescents

[a]Based on Norris et al.[3]

possible to take in." For some, the emotion that is implicit in these words will only surface in the aftermath of survival, when the individual begins to reflect on the full reality of what has occurred.

Associated symptoms include feelings of guilt, shame or despair, increased hostility, domestic violence, withdrawal, social isolation, and loss of belief structures. Importantly, these symptoms may occur irrespective of whether specific psychological disorders such as PTSD are present. Somatic symptoms include gastrointestinal, cardiovascular, neurologic, musculoskeletal, respiratory, dermatologic, or urological problems.

Notwithstanding this broad range of psychological and somatic problems associated with trauma, trauma victims are generally highly resilient; most develop appropriate coping strategies and use social support networks to reach an understanding and acceptance of their experience. As a result, the majority recover with time, becoming able to resume normal activities and face reminders of their trauma, despite the associated distress. For example, in a study of 95 female rape victims,[4] 94% met symptomatic criteria for PTSD when interviewed within 30 days of the assault, whereas only 65% did so at a mean of 5 weeks after the assault, and 47% showed PTSD symptoms after an average of 94 days. Similarly, in a study of survivors of the September 11 terrorist attacks in New York,[5] PTSD symptoms had resolved within 1 year after the attacks in 57% of participants.

In disaster situations where people's homes and livelihoods have been destroyed, the longitudinal course of recovery is likely to be quite different. Adversity in the aftermath of the disaster and the continued struggle for survival can escalate the individual's distress in the wake of a sense of euphoria from having survived the initial onslaught of the disaster. The battle for survival in economically disadvantaged communities has the ability to wear people down.

SYMPTOMS OF PTSD

The Fourth Edition of the American Psychiatric Association *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) recognizes 3 distinct symptom clusters associated with PTSD: reexperiencing the event, avoidance and numbing, and hyperarousal (Table 2).[6] To qualify for a diagnosis of PTSD, individuals must have been exposed to a stressor that triggers feelings of intense fear, helplessness, or horror, and the symptoms must produce clinically significant distress or functional impairment for a minimum of 4 weeks.

Negative thoughts about the self, other people, and the future are a common feature of PTSD. These can lead to a perception that the world is an extremely dangerous place, and that other people cannot be trusted, or that the victim is incompetent, that other people could have prevented the trauma, and that PTSD symptoms are a sign of weakness. Such negative thoughts are influenced by a variety of factors, including a history of trauma, prior personal or family psychopathology, and a lack of positive social support. Avoidance of situations that recall the trauma can strengthen negative perceptions; conversely, talking and thinking about the trauma can promote an organized, coherent narrative of the victim's experience, enabling the victim to recognize that trauma is an uncommon event.

Patients with PTSD are often unable to structure their recollections of their trauma. In a positron emission tomography (PET) study,[7] patients with PTSD did not show the bilateral activation of the dorsolateral prefrontal cortex that normally occurs during updating of working memory in response to trauma-neutral verbal information. By contrast, the PTSD patients showed increased bilateral activation of the superior parietal lobe, compared with control subjects. This might suggest increased reliance on visuospatial coding of information in working memory function, rather than verbal cues, among patients with PTSD. As a result, PTSD patients may have difficulty expressing their feelings of distress after trauma. The neurobiological basis of PTSD is discussed further (see The Neurobiology of PTSD).

Physical Symptoms of PTSD

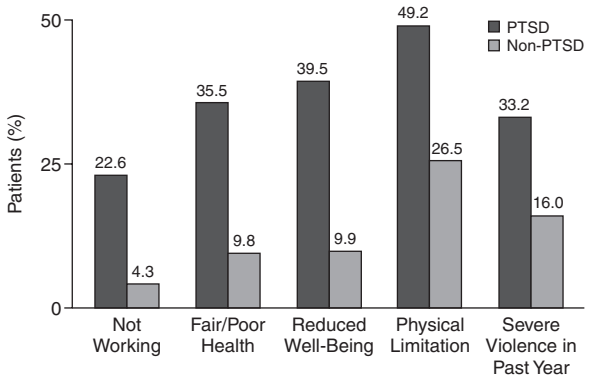
Although the DSM-IV criteria emphasize psychological symptoms in the diagnosis of PTSD, it should be noted that many patients with PTSD (particularly in primary care) present with predominantly physical, rather than psychological, symptoms. Such symptoms may include physical pain and lower gastrointestinal, dermatologic, or skeletomuscular disorders.[8] Sleep disturbances, such as violent or injurious behavior during sleep, sleep paralysis, and sleep talking, are also common in patients with PTSD.

Table 2. Symptoms of Posttraumatic Stress Disorder According to DSM-IV[a]

Reexperiencing	Avoidance and Numbing	Hyperarousal
Recurrent, intrusive, distressing memories	Avoiding thoughts, feeling, or conversations connected to the event	Difficulty falling or staying asleep
Recurrent distressing dreams	Avoiding activities, places, or people connected to the event	Irritability or outbursts of anger
Illusions, hallucinations, dissociative flashback episodes	Amnesia about certain important aspects of the event	Problems concentrating
Intense psychological distress when exposed to reminiscent cues	Decreased interest in once-enjoyed activities	Hypervigilance
Physiological reactivity on exposure to external or internal cues	Feeling detached from others	Exaggerated startle response
	Emotional numbing/restricted range of affect	
	A sense of foreshortened future	

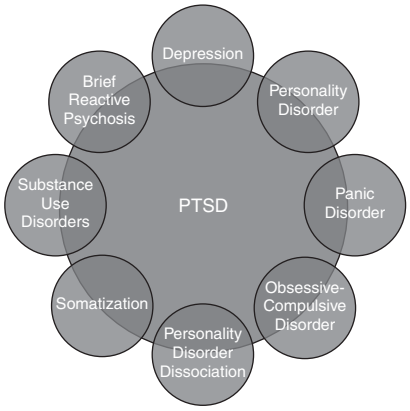
[a]Adapted from the American Psychiatric Association.[6]

Figure 1. Impaired Function and Quality of Life in Vietnam War Veterans With PTSD, Compared With Veterans Without PTSD[a]



[a]Data from Zatzick et al.[11]
Abbreviation: PTSD = posttraumatic stress disorder.

Figure 2. Symptom Overlap Between Posttraumatic Stress Disorder (PTSD) and Other Psychiatric Conditions[a]



[a]Based on Kessler et al.[14]

In one study of a general urban population,[9] for example, sleep disturbances were present in approximately 70% of patients with PTSD. Fatigue and sense of ill health can contribute significantly to the disability that an individual develops.

Impact of PTSD Symptoms on Functioning and Quality of Life

PTSD can have a devastating impact on the victim. Data from the National Comorbidity Survey (NCS) in the United States show that individuals with PTSD are 6 times more likely than those without PTSD to attempt suicide and that, overall, 19% of PTSD patients will attempt suicide.[10] This reflects a substantial impairment of quality of life and normal functioning in patients with PTSD. In a study of 1200 Vietnam War veterans,[11] for example, participants with PTSD were significantly more likely than those without PTSD to be not working, to report impaired health and physical functioning, and to have committed a violent act within the previous year (Figure 1). Similarly, in a longitudinal study of patients with anxiety disorders,[12] patients with PTSD showed significantly higher incidences of suicide attempts, alcohol abuse or dependence, and hospitalization for psychiatric illness, compared with patients with a history of trauma but no PTSD.

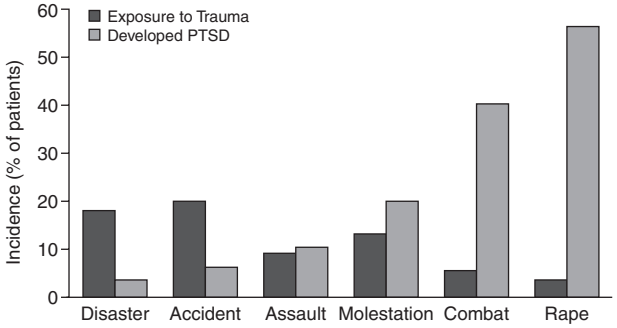
Overlap Between PTSD Symptoms and Those of Other Psychiatric Conditions

The diagnosis of PTSD is a useful organizing construct to categorize symptoms following trauma. However, it is important to recognize that there is considerable overlap between the symptoms of PTSD and those of a number of other psychiatric conditions, including MDD, GAD, panic disorder, obsessive-compulsive disorder, and reactive psychosis (Figure 2).[13,14] Indeed, PTSD may not necessarily be the most common disorder after trauma; rather, it is the one whose onset is most easily defined.

THE SEQUENTIAL ETIOLOGICAL PROCESS LEADING TO PTSD AND ITS PREDICTORS

PTSD represents a failure of natural recovery following an acute stress, and as such is not a normal event. It is the fifth most common psychiatric disorder in the United States, with a lifetime prevalence of 7.8% in the NCS.[14] However, trauma is a much more common occurrence, affecting 61% of men and 51% of women in the NCS.[14]

Figure 3. Incidence of Posttraumatic Stress Disorder (PTSD) in Relation to Type of Trauma in the National Comorbidity Survey[a]



[a]Data from Kessler et al.[14]

Clearly, as noted above, not all traumatized individuals develop PTSD. The incidence is higher in specific high-risk groups, and certain types of trauma are more likely to result in PTSD than others.

Risk Factors for Acute PTSD

Data from the NCS show that the prevalence of generalized PTSD varies markedly according to the nature of the trauma involved. Although rape was a relatively uncommon trauma, it was associated with the highest prevalence of PTSD in both men and women (Figure 3).[14] By contrast, natural disasters and accidents affected a higher proportion of the population, but accounted for relatively low prevalences of PTSD.

The same study showed that the lifetime incidence of PTSD was approximately twice as high in women as in men (10.4% vs. 5.0%, respectively, $p < .05$).[14] The lifetime prevalence was higher among the previously married than among the currently married, but this was significant only in women (18.9% vs. 9.6%, $p = .004$). The prevalence was also higher among the married than among the never married, but this was significant only in men (6.1% vs. 1.9%, $p = .001$).

It is worth noting that the increased rate of PTSD in women may not be universal and may be influenced by cultural factors. For example, in the Australian replication of the NCS, the rates of PTSD were similar in men and women.[15]

Individual factors render some people more susceptible to PTSD than others. The review of 160 studies of disaster victims cited previously identified a number of risk factors for adverse outcomes such as PTSD, including severity of exposure to trauma, secondary stressors such as financial difficulties, prior psychiatric illness, and deteriorating psychosocial resources (Table 3).[3]

A meta-analysis by Brewin et al.[16] examined the impact of 14 risk factors for generalized PTSD: gender, age at the time of trauma, socioeconomic status, education, intelligence, race, previous psychiatric history, reported abuse in childhood, reports of previous traumatization, reports of other adverse childhood factors, family history of psychiatric disorder, trauma severity, posttrauma life stress, and posttrauma social support. Each of these was found to be highly significant statistically, but the size of the effects varied markedly. The largest effects were seen with factors operating during or after the trauma: trauma severity, lack of social support, and posttrauma stress. In general, factors that were present before the trauma had relatively little effect on the risk of PTSD.

Table 3. Risk Factors for Posttraumatic Stress Disorder After a Major Disaster[a]

Severe exposure to the trauma
Living in a highly disrupted community
Female gender
Belonging to an ethnic minority group
Middle age
Poverty or low socioeconomic status
Presence of children in the home
Presence of a distressed spouse
Psychiatric history
Impoverished support system

[a]Based on Norris et al.[3]

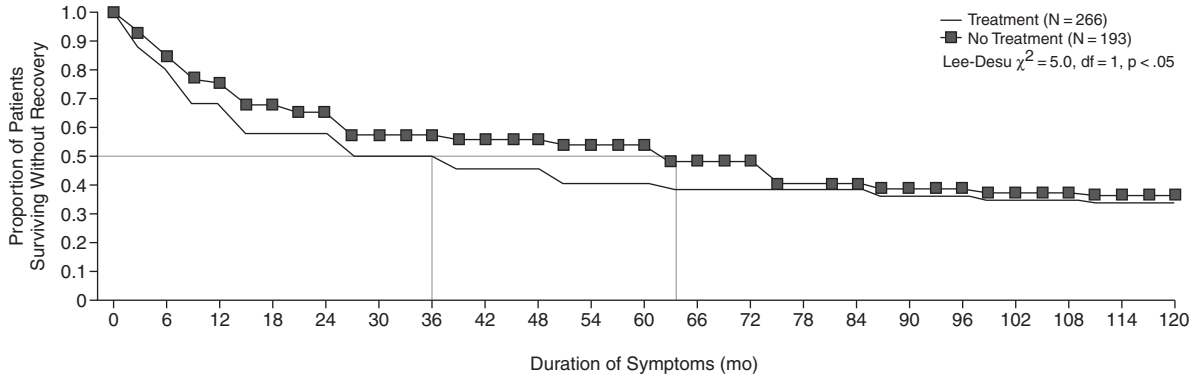
Time Course of PTSD

PTSD should be considered as occurring in a series of stages.[1] Symptoms developing within 4 weeks after the trauma are considered to represent an acute stress disorder that constitutes a normal response to stress. The majority of patients with such symptoms do not develop any pathological sequelae. Thus, PTSD does not begin in the immediate aftermath of the trauma, but may represent a lack of resolution of the acute stress response.[1] Although PTSD resolves in approximately 60% of cases (Figure 4),[14] some individuals go on to develop chronic, unremitting PTSD.

According to the DSM-IV criteria, PTSD is considered acute if symptoms resolve within 3 months or chronic if symptoms persist for 3 months or longer.[6] Acute PTSD is attributed to time-dependent sensitization following trauma. By contrast, chronic PTSD results from prolonged exposure to the normal adaptive responses to changing circumstances.[17] Secondary stressors, such as loss of home or livelihood after a disaster, are likely to play an important role in the development of chronic PTSD.

Delayed-onset PTSD, which develops at least 6 months after the trauma, is recognized as a discrete subcategory of PTSD, but relatively little is known about this condition. The available evidence suggests that delayed-onset PTSD is uncommon following disasters.[1,18] For example, in a study of 469 Australian firefighters exposed to a major bushfire,[18] a delayed onset of PTSD was rare, and some patients who reported such a course could not recall their acute posttraumatic symptoms. Other studies have re-

Figure 4. Kaplan-Meier Curves Showing the Duration of Symptoms in Patients With Posttraumatic Stress Disorder in the National Comorbidity Survey[a,b]



[a]Reprinted with permission from Kessler et al.[14]
[b]Mean duration of symptoms was 64 months in people who never received treatment, compared with 36 months in people who received treatment.

ported marked fluctuations in PTSD symptoms during long-term follow-up of survivors of natural disasters, which may explain the occurrence of at least some cases of apparently delayed onset of PTSD.[1,19]

PTSD symptoms can persist for many years after the trauma. The NCS data show that the mean duration of symptoms in people who never received treatment was 64 months, compared with 36 months in people who received treatment for their symptoms.[14] Moreover, in more than one third of affected individuals, symptoms persisted even after many years, and even when treatment was given (Figure 4). This is consistent with data from survivors of 2 disasters in the United Kingdom.[20,21] In a study of survivors of the 1988 Piper Alpha oil platform fire,[20] 21% of participants met the most stringent criteria for PTSD more than 10 years after the event. Approximately one third of participants reported persistent feelings of guilt at 10 years, and this, together with physical injury during the disaster, was significantly associated with high levels of posttraumatic symptoms. A second study[21] investigated the long-term outcome in survivors of the 1966 Aberfan disaster, in which a coal slag heap collapsed onto a primary school, killing 116 children. After 33 years, 46% of survivors had experienced PTSD at some time, compared with 20% of matched controls (odds ratio [OR] = 3.38, 95% confidence interval [CI] = 1.40 to 8.47), and 29% met the diagnostic criteria for current PTSD.

Risk Factors for Chronic PTSD

What factors influence the development of chronic PTSD? In a study of young adults,[22] individuals with chronic PTSD showed a higher total number of PTSD symptoms, and higher rates of numbing and hyperreactivity to stressors, anxiety or affective disorders, and other comorbid medical conditions, compared with individuals with nonchronic PTSD. Female sex and a family history of PTSD were independent risk factors for chronic PTSD.

Avoidance behaviors in response to stressors also influence the development of chronic PTSD. Avoidance symptoms tend to increase with time, whereas intrusive symptoms decrease.[1,23] Such symptoms may prevent recovery by limiting exposure to experiences that correct negative perceptions and beliefs and by preventing the organization of the memory and consignment of the trauma to the past. Furthermore, avoidance symptoms can maintain the individual's perception that the world is a dangerous place and that he or she cannot cope effectively with stress.

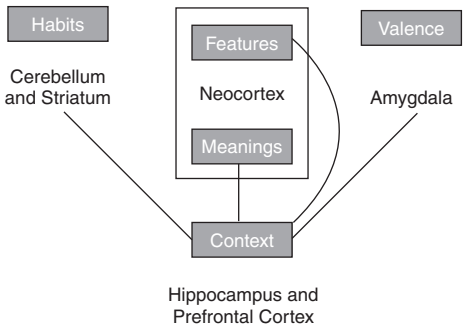
THE NEUROBIOLOGY OF PTSD

Stressful situations trigger adaptive responses aimed at maintaining a constant internal environment in the face of changing demands on the individual, a process known as allostasis.[17,24] These responses, although beneficial in the short term, impose an allostatic load on the individual, which if maintained can result in PTSD and other disorders.

The hypothalamus-pituitary-adrenal (HPA) axis plays an important role in the acute response to stress. During the acute phase, glucocorticosteroid release has a number of effects that are beneficial for short-term survival, including suppression of immune function, activation of the autonomic nervous system, and replenishment of energy reserves by promoting the conversion of proteins and lipids into carbohydrates.[24,25] However, prolonged stress results in sustained elevation of circulating glucocorticosteroids, which can produce structural and functional changes in areas of the brain involved in learning and memory processing (see Neuroanatomy of PTSD).[24]

PTSD patients show a number of alterations in the HPA system. Concentrations of corticotropin-releasing factor

Figure 5. Anatomical Areas Involved in Memory[a,b]



[a]Based on Nadel and Moscovitch.[28]
[b]According to this model, semantic information (information about feelings and meanings of words) is stored in the neocortex, habitual information (that required for acquired skills such as playing a musical instrument) in the cerebellum and striatum, and information about feelings (valence) in the amygdala. The hippocampus and prefrontal cortex are necessary for retrieval of episodes and their contextual framework, and for extraction of semantic information to be stored in the neocortex. Posttraumatic stress disorder is associated with hippocampal damage, resulting in difficulties in forming structured contextual memories of the trauma.

(CRF) in the cerebrospinal fluid are elevated,[25] presumably reflecting hypersecretion of this peptide by the hypothalamus. Paradoxically, however, circulating cortisol concentrations are reduced, compared with individuals without PTSD.[26] This could be due to down-regulation of the adrenocorticotropic hormone (ACTH) response to CRF,[27] which would result in decreased secretion of cortisol. In animal models, CRF release is associated with an increase in the number and sensitivity of glucocorticosteroid receptors in brain areas involved in memory and the control of fear and arousal responses, such as the hippocampus.[25] Such findings suggest that hypersecretion of CRF in PTSD patients would result in the promotion of anxiety and fear-related behaviors.

Neuroanatomy of PTSD

Data from animal and clinical studies are converging to indicate that multiple memory systems exist, with distinct anatomical localizations and organization.[28,29] According to this view, different types of information are stored in the cerebellum, neocortex, and amygdala, and the hippocampus is necessary for "explicit" memory—the retrieval of episodes and their contextual framework (Figure 5).[28] The hippocampus is also responsible for suppressing the fear response in the amygdala under conditions of medium stress, but this pathway is blocked under conditions of extreme stress, resulting in an exaggerated fear response.[30,31]

The hippocampus is a major target organ for glucocorticosteroids in the brain[32] and is particularly vulnerable to neurotoxicity resulting from high levels of glucocorticosteroids following stress. A number of interventions, including prolonged stress, glucocorticosteroid treatment, and developmental lead exposure result in remodeling and atrophy of hippocampal pyramidal neurons.[24,32,33] The effects of stress on the hippocampus can be blocked by an inhibitor of adrenal steroid synthesis, indicating that they are a result of prolonged exposure to glucocorticosteroids.[24] The effects of glucocorticosteroids on hippocampal cell volume may be due both to direct glucocorticoid effects on cell metabolism and an increased susceptibility to excitatory amino acids and other neurotoxic agents.[34]

Studies using imaging techniques such as functional magnetic resonance imaging (fMRI) and PET have provided data on changes in hippocampal volume in patients with PTSD and healthy controls. For example, Bremner et al.,[35] in an MRI study of 26 Vietnam veterans with PTSD, showed that the volume of the right hippocampus was reduced by 8% ($p = .03$), compared with that in matched control subjects; the volume of the left hippocampus was also reduced, by 3.8%, but this difference was not statistically significant. In a second study,[36] quantitative volumetric MRI techniques were used to compare hippocampal volumes in 7 Vietnam veterans with PTSD, with those in 7 combat veterans without PTSD and 8 normal control subjects. Both left and right hippocampal volumes were significantly lower in veterans with PTSD than in the other 2 groups, and these differences remained after adjustment for age, whole brain volume, and lifetime alcohol consumption. A reduction in hippocampal volume, compared with control subjects, has also been reported in adult patients with PTSD related to childhood physical or sexual abuse.[34,37] A meta-analysis of 9 studies[38] reported a significant reduction in volume of both the right and left hippocampi in 133 adults with PTSD compared with 148 healthy controls. However, other studies have failed to demonstrate such an association.[38]

Several studies have reported correlations between decreases in hippocampal volume and PTSD symptoms. In a study of 21 women who reported being severely sexually abused during childhood,[37] the volume of the left hippocampus was decreased by 5%, compared with nonabused controls; there was a significant negative correlation between left hippocampal volume and the severity of dissociative symptoms ($r = –0.73$, $p < .0002$), although no correlation was seen between left hippocampal volume and measures of explicit memory functioning. Bremner et al.[34] reported a similar decrease in left hippocampal volume in adult survivors of childhood physical or sexual abuse. In this study, however, there was only a weak and nonsignificant correlation between left hippocampal volume and the number of PTSD symptoms present ($r = 0.29$, $p = .31$).

Such findings suggest that PTSD is associated with damage to the hippocampus, which might result in deficits in explicit memory functioning. It is important to recog-

nize, however, that the relationship between PTSD and hippocampal volume may not be causal. It is possible, for example, that hippocampal damage is present before the onset of PTSD and may in some way predispose the individual to develop the condition.[39]

There are data to suggest that emotions associated with PTSD symptoms are mediated by the limbic and paralimbic systems in the right hemisphere.[12,40–42] In one study, for example, activation of different brain areas was measured by PET in 8 PTSD patients following exposure to audiotaped trauma-related or neutral scripts.[40] Compared with control conditions, traumatic stimuli provoked marked activation of the right-sided limbic, paralimbic, and visual areas and decreased activation of the left inferior frontal and middle temporal cortex. Such activation of the visual cortex may be responsible for reexperiencing phenomena in PTSD, since it has been shown that visual imagery is mediated by topographically organized visual cortex.[43] However, reexperiencing phenomena are distinct from ordinary visual mental images—to the person experiencing a flashback, it feels as if the trauma is reoccurring[6]—and hence these may require activation or deactivation of other brain areas in addition to activation of visual cortex.[40] The finding that Broca's area (the left inferior frontal cortex and middle temporal cortex) was deactivated following exposure to trauma-related stimuli may indicate movement of resources from higher cognitive functions, such as language processing and verbalization. This would be consistent with the finding that PTSD patients have difficulty in cognitively structuring their traumatic memories and make less use of verbal memory in structuring their experiences.[7]

In summary, the available evidence suggests that PTSD is associated with an increased allostatic load, with prolonged activation of the HPA axis. A decrease in hippocampal volume might precede or follow, resulting in the impairment of explicit memory and perhaps also loss of restraint of fear responses mediated by the amygdala and other components of the limbic system. The damage to the hippocampus might mean that the individual is unable to form structured contextual memories of the trauma, while deactivation of Broca's area might prevent the individual from developing verbal representations of the trauma.

Neurochemical Systems Involved in the Psychopathology of PTSD

Exposure to traumatic stressors leads to activation of arousal responses mediated by the serotonergic and noradrenergic systems and to changes in numerous other neurotransmitter and neuroendocrine systems.[44,45] In animal studies, serotonergic mechanisms have been shown to be involved in the conditioned fear responses, mediated by the amygdala, and involving CRF release, and in symptoms such as intrusions, depression, depersonalization, and avoidance behaviors.[46,47]

Resilience and vulnerability in the face of extreme stress are mediated by multiple neurochemical and neuroendocrine mechanisms.[45] There is evidence that corticotropin-releasing hormone (CRH), dopaminergic and glutamatergic systems, and estrogens are among the factors involved in the mediation of vulnerability; conversely, factors mediating resilience include dehydroepiandrosterone (DHEA), neuropeptide Y, galanin, testosterone, serotonin acting via the 5-HT_{1A} receptor, and benzodiazepine receptor function.[45]

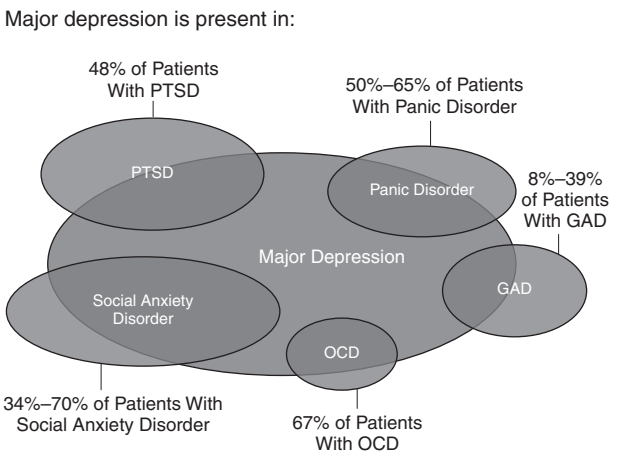
Treatment of PTSD, whether by medication or psychotherapy, may reverse the functional and structural changes in the affected systems, leading to normalization of responses to stress. Evidence for this hypothesis comes from a study in which 11 patients with PTSD underwent single photon emission computed tomography (SPECT) scanning before and after treatment with a selective serotonin reuptake inhibitor (SSRI).[48] Significant deactivation of the left medial temporal cortex was observed following SSRI treatment, irrespective of antidepressant response. There was a significant correlation between reductions in PTSD symptoms and activation of the left paracingulate region (medial prefrontal cortex). Such findings suggest that SSRI treatment may eliminate learned fear responses by reversing the abnormal regulation of amygdala activity by the medial prefrontal cortex seen in PTSD.[48,49] A second study,[50] involving 28 PTSD patients, has shown significant reductions in PTSD symptoms, which were associated with a 4.6% increase in mean hippocampal volume on MRI, following treatment with an SSRI for 9 to 12 months.

PSYCHIATRIC AND PHYSICAL COMORBIDITY FOLLOWING TRAUMA

Although PTSD may be the most common disorder following trauma, it represents only a part of the clinical picture. Comorbidity with other psychiatric or somatic disorders is common (Figure 6)[6,14,51–54]; indeed, the epidemiologic evidence suggests that psychiatric comorbidity is the rule rather than the exception.[13] In the NCS, a lifetime history of at least 1 other psychiatric disorder was present in 88.3% of men and 79% of women with a lifetime history of PTSD; 59% and 44%, respectively, had 3 or more concomitant disorders.[14] Typically, however, PTSD precedes other disorders; in the NCS, PTSD was the primary diagnosis in 29% to 51% of men and 41% to 58% of women with comorbid disorders.[14]

Despite the high prevalence of comorbid disorders in patients with PTSD, little is known about risk factors for comorbidity. For example, a study of reactions to the September 11 terrorist attacks showed a higher prevalence of probable PTSD among residents of the New York City metropolitan area than among residents of other major U.S. urban centers, but noted that further research would

Figure 6. Comorbidity of PTSD and Other Psychiatric Disorders[a]



[a]Based on references 6, 14, and 51–54.
Abbreviations: GAD = generalized anxiety disorder, OCD = obsessive-compulsive disorder, PTSD = posttraumatic stress disorder.

be necessary to document the time course and outcome of psychiatric disorders in affected individuals.[55] This lack of data reflects the difficulties involved in designing epidemiologic studies of psychiatric illness after major disasters.[56] Such studies require careful attention to timing, sampling, measurement, and interpretation of data. Moreover, reactions to different types of trauma can vary considerably: for example, survivors of natural disasters may show different reactions to survivors of terrorist attacks, while even within the context of an individual disaster, differing reactions may be seen in subpopulations of survivors.[56]

Traumatic Grief

Traumatic grief is common after a major disaster. The symptoms of traumatic grief are distinct from those of depression and anxiety, but show clinical correlations with those of depression. Moreover, traumatic grief symptoms are predictive of mental and physical health impairments, independent of the effect of depressive symptoms. For these reasons, traumatic grief is now considered to be a distinct clinical syndrome in its own right.[57]

Traumatic grief can produce symptoms that overlap with those of PTSD, such as recurrent intrusive thoughts and images of death and avoidance of situations, activities, or people associated with the event. In addition, however, traumatic grief can produce symptoms such as intense yearning and longing for the dead person and extreme sadness rather than anxiety and arousal (Table 4).[57] As a result, the grieving process following a disaster may differ from that in the absence of trauma. In normal grief, the individual is able to retrieve positive memories of the deceased person, whereas following a disaster, traumatic memories may intrude and inhibit this process. By this means, traumatic grief can itself give rise to and perpetuate PTSD symptoms.

Table 4. Diagnostic Criteria for Traumatic Grief[a]

Criterion A
Person has experienced the death of a significant other
Response involves 3 of the 4 symptoms below experienced at least sometimes:
Intrusive thoughts about the deceased
Yearning for the deceased
Searching for the deceased
Loneliness as a result of the death
Criterion B
In response to the death, 4 of the following 8 symptoms are experienced as mostly true:
Purposelessness or feelings of futility about the future
Subjective sense of numbness, detachment, or absence of emotional responsiveness
Difficulty acknowledging the death (eg, disbelief)
Feeling that life is empty or meaningless
Feeling that part of oneself has died
Shattered worldview (eg, loss of sense of security, trust, or control)
Assumes symptoms or harmful behaviors of, or related to, the deceased person
Excessive irritability, bitterness, or anger related to the death
Criterion C
Duration of disturbance (symptoms listed above) is at least 2 months
Criterion D
The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning

[a]Adapted with permission from Prigerson et al.[57]

Major Depressive Disorder

The core symptoms in MDD are a depressed mood and anhedonia (an inability to feel normal happiness or pleasure). These are usually accompanied by a range of both psychological symptoms, such as feelings of worthlessness, excessive guilt, and suicidality, and physical symptoms such as changes in appetite, sleep disturbances, and loss of energy.

MDD is the most common concomitant psychiatric disorder in patients with PTSD.[13] In the NCS, for example, 48% of men and 49% of women with PTSD had a lifetime diagnosis of MDD.[14] This is perhaps not surprising, as there is a well-established causal relationship between stressful events and depressive illness.[58] Conversely, however, a history of MDD is predictive of PTSD after exposure to major trauma.[13] The frequent coexistence of PTSD and MDD reflects the shared neurobiology of the 2 conditions. In both cases, sensitization resulting from exposure to secondary stressors can lead to "kindling" effects that exacerbate symptoms and impair normal recovery.

The presence of MDD is associated with greater functional impairment in patients with PTSD. For example, in a study of trauma survivors recruited from an emergency room,[59] individuals with concomitant PTSD and MDD showed more severe symptoms and lower functioning than those with either disorder alone. Similarly, a study of motor accident survivors[60] showed that PTSD and MDD

were correlated but independent responses to the trauma; again, individuals with both disorders showed greater functional impairment and were less likely to show remission of symptoms over 6 months.

Generalized Anxiety Disorder

Generalized anxiety disorder is defined by excessive worry and apprehension about events or activities, occurring most days for at least 6 months, which is difficult to control and unrelated to other Axis I disorders.[6] Psychological symptoms of GAD include persistent feelings of fearful anticipation, irritability, impaired concentration, and restlessness. Physical symptoms include muscle tension and symptoms of autonomic hyperarousal, such as palpitations and tightness or pain in the chest.

In the NCS, GAD occurred in 16.8% of men and 15% of women with PTSD.[14] However, in contrast to comorbid depressive illness, in which PTSD is usually the primary disorder, PTSD is more likely to develop after anxiety disorders such as GAD.[13,14] This suggests that symptoms of arousal and avoidance may develop as a coping mechanism following exposure to trauma.[13]

Panic Disorder

Panic disorder is characterized by recurrent, spontaneous episodes of intense anxiety with associated somatic and psychiatric symptoms (panic attacks). The incidence of panic disorder among persons with PTSD in the NCS was 7.3% in men and 12.6% in women.[14] Since some studies have found that panic disorder tends to be more common in individuals exposed to traumas involving extreme autonomic arousal, hypervigilance, and unpredictability, it has been suggested that panic disorder and PTSD are interrelated, rather than comorbid, disorders.[13,61] In panic disorder, however, fear and avoidance are related to the physical symptoms associated with panic attacks (anticipatory anxiety), whereas in PTSD they are specifically related to trauma-related memories and situations.[13]

Sometimes, the relationship between the panic symptoms and the subtle triggers of the traumatic experience goes undetected. For example, physical sensations such as pain and movement may have the same somatosensory quality as the traumatic experience, but the individual has little conscious awareness of this issue.

Substance Abuse

Abuse of nicotine, alcohol, or narcotic drugs is common among patients with PTSD.[14,62–65] In the NCS, 52% of men and 28% of women with PTSD reported alcohol abuse or dependence, while 35% and 27%, respectively, reported abuse of or dependence on other substances.[14] Increased substance use after trauma appears to be related to PTSD, rather than exposure to stress per se.[63,64] The available evidence suggests that the association between PTSD and substance abuse is causal in nature.[66] For example, in a longitudinal study of Australian firefighters exposed to a natural disaster, PTSD was associated with both increases and decreases in alcohol consumption, and these changes could be attributed to PTSD rather than exposure to stress.[18,66,67] However, the association is not simple: for example, some people may use alcohol or narcotics as a form of self-medication to relieve the symptoms of PTSD, and this may obscure the association by modifying the underlying symptoms.[66]

Although some studies have suggested that substance abuse is more common among combat veterans than among survivors of natural disasters,[61,68] more recent evidence suggests that the intensity of the emotional reaction, rather than the nature of the trauma, is the predominant factor involved. For example, in a study of 84 individuals who sought support after the 1995 Oklahoma City bombing,[64] those who reported increased smoking or drinking after the attack showed more severe peritraumatic reactions, grief, posttraumatic stress, and worries about safety, and greater impairment of functioning, than those who did not. There were no significant differences in sensory or interpersonal exposure to the trauma between participants who increased their smoking or drinking and those who did not.

As with PTSD, substance abuse after trauma may have a long-term impact on health and well-being. In a study of New York City residents after the September 11 attacks,[65] the increase in substance use seen following the attacks persisted during the first 6 months after the attacks, whereas the incidence of PTSD and depression decreased by more than 50% during the same period.

Somatic Symptoms

Numerous physical (somatization) symptoms may coexist with PTSD, and these can have a significant impact on normal functioning and the course of PTSD.[69] In a study of young adults,[70] the incidence of somatization symptoms was 3 times higher in individuals with PTSD than in those without PTSD (24.7% vs. 8.2%, respectively). Moreover, a baseline history of PTSD was associated with an increased risk of pain (OR = 2.1) or conversion symptoms (OR = 2.3) during follow-up, compared with individuals without PTSD. Other studies have demonstrated increased rates of cardiopulmonary, neurologic, and musculoskeletal symptoms among combat veterans[71] and firefighters[72] with PTSD, compared with members of the same groups without PTSD.

Physical symptoms in patients with PTSD may result from a number of causes, including injuries sustained during the original trauma and its aftermath (for example, infectious diseases following a natural disaster), comorbid substance abuse, and physiological responses to secondary stressors, such as loss of home or livelihood. Physical symptoms may be present even when the issue of injury has been controlled for. The first explanation for this is

that the symptoms represent the awareness and reporting of psychophysiologic concomitants of the dysregulation that is central to the PTSD. Alternatively, the symptoms may represent a somatic component of the traumatic memory.

The finding that physical symptoms are common in patients with PTSD has important diagnostic implications. There is a high probability that a person presenting with physical symptoms after a disaster may have both a physical and a psychological disorder. However, somatization is common; hence, the absence of a demonstrable medical disorder in a patient with physical symptoms does not mean that no disorder exists.

CONCLUSION

Acute stress reactions are common and expected after disaster and other trauma. While these can be distressing to the individual concerned, resilience is also common and most affected individuals recover with time. In some cases, however, recovery is incomplete, leading to a number of psychiatric conditions, of which PTSD is the most frequently encountered. PTSD often coexists with a variety of psychiatric and physical disorders, which further increase the burden of suffering experienced by the patient.

Neuroimaging and neurobiological studies are providing important new insights into the brain regions and pathways involved in the development of PTSD symptoms and the recovery from trauma. These insights are focusing attention on the potential benefits of the treatment of PTSD; studies with SSRIs suggest that these agents have positive effects in patients with PTSD,[11] and there is also evidence that they are able to normalize the characteristic psychobiology of PTSD.

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling has been presented in this article.

REFERENCES

1. McFarlane AC. Posttraumatic stress disorder: a model of the longitudinal course and the role of risk factors. J Clin Psychiatry 2000;61(suppl 5): 15–20
2. van der Kolk BA, Burbridge JA, Suzuki J. The psychobiology of traumatic memory. Ann N Y Acad Sci 1997;821:99–113
3. Norris FH, Friedman MJ, Watson PJ, et al. 60,000 disaster victims speak, pt 1: an empirical review of the empirical literature, 1981–2001. Psychiatry 2002;65:207–239
4. Rothbaum BO, Foa EB, Riggs DS, et al. A prospective examination of post-traumatic stress disorder in rape victims. J Trauma Stress 1992; 5:455–475
5. Nandi A, Galea S, Tracy M, et al. Job loss, unemployment, work stress, job satisfaction, and the persistence of posttraumatic stress disorder one year after the September 11 attacks. J Occup Environ Med 2004;46: 1057–1064
6. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington, DC: American Psychiatric Association; 2000
7. Clark CR, McFarlane AC, Morris P, et al. Cerebral function in posttraumatic stress disorder during verbal working memory updating: a positron emission tomography study. Biol Psychiatry 2003;53:474–481
8. Davidson JRT, Stein DJ, Shalev AY, et al. Posttraumatic stress disorder: acquisition, recognition, course, and treatment. J Neuropsychiatry Clin Neurosci 2004;16:135–147
9. Ohayon MM, Shapiro CM. Sleep disturbances and psychiatric disorders associated with post-traumatic stress disorder in the general population. Compr Psychiatry 2000;41:469–478
10. Kessler RC, Borges G, Walters EE. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. Arch Gen Psychiatry 1999;56:617–626
11. Zatzick DF, Marmar CR, Weiss DS, et al. Posttraumatic stress disorder and functioning and quality of life outcomes in a nationally representative sample of male Vietnam veterans. Am J Psychiatry 1997;154:1690–1695
12. Warshaw MG, Fierman E, Pratt L, et al. Quality of life and dissociation in anxiety disorder patients with histories of trauma or PTSD. Am J Psychiatry 1993;150:1512–1516
13. Brady KT, Killeen TK, Brewerton T, et al. Comorbidity of psychiatric disorders and posttraumatic stress disorder. J Clin Psychiatry 2000;61 (suppl 7):22–32
14. Kessler RC, Sonnega A, Bromet E, et al. Posttraumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 1995;52: 1048–1060
15. Creamer M, Burgess PM, McFarlane AC. Post traumatic stress disorder: findings from the Australian National Survey of Mental Health and Wellbeing. Psychol Med 2001;31:1237–1247
16. Brewin CR, Andrews B, Valentine JD. Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. J Consult Clin Psychol 2000;68:748–766
17. McEwen BS. Mood disorders and allostatic load. Biol Psychiatry 2003;54:200–207
18. McFarlane AC, Papay P. Multiple diagnoses in posttraumatic stress disorder in the victims of a natural disaster. J Nerv Ment Dis 1992;180: 498–504
19. Grace MC, Green BL, Lindy JD, et al. The Buffalo Creek disaster: a 14-year follow-up. In: Wilson JP, Raphael B, eds. International Handbook of Traumatic Stress Syndromes. New York, NY: Plenum Press; 1993: 441–449
20. Hull AM, Alexander DA, Klein S. Survivors of the Piper Alpha oil platform disaster: long-term follow-up study. Br J Psychiatry 2002;181: 433–438
21. Morgan L, Scourfield J, Williams D, et al. The Aberfan disaster: 33-year follow-up of survivors. Br J Psychiatry 2003;182:532–536
22. Breslau N, Davis GC. Posttraumatic stress disorder in an urban population of young adults: risk factors for chronicity. Am J Psychiatry 1992;149: 671–675
23. Blank A. The longitudinal course of posttraumatic stress disorder. In: Davidson J, Foa EB, eds. Posttraumatic Stress Disorder: DSM-IV and Beyond. Washington, DC: American Psychiatric Press; 1993:3–22
24. McEwen BS. The neurobiology of stress: from serendipity to clinical relevance. Brain Res 2000;886:172–189
25. Bremner JD, Licinio J, Darnell A, et al. Elevated CSF corticotropin-releasing factor concentrations in posttraumatic stress disorder. Am J Psychiatry 1997;154:624–629
26. Boscarino JA. Posttraumatic stress disorder, exposure to combat, and lower plasma cortisol among Vietnam veterans: findings and clinical implications. J Consult Clin Psychol 1996;64:191–201
27. Smith MA, Davidson J, Ritchie JC, et al. The corticotrophin-releasing hormone test in patients with posttraumatic stress disorder. Biol Psychiatry 1989;26:349–355
28. Nadel L, Moscovitch M. Hippocampal contributions to cortical plasticity. Neuropharmacology 1998;37:431–439
29. Squire LR. Memory and the hippocampus: a synthesis from findings with rats, monkeys, and humans. Psychol Rev 1992;99:195–231
30. McGaugh JL. The amygdala modulates the consolidation of memories of emotionally arousing experiences. Annu Rev Neurosci 2004;27:1–28
31. Baddeley A, Bueno O, Cahill L, et al. The brain decade in debate, 1: neurobiology of learning and memory. Braz J Med Biol Res 2000;33: 993–1002
32. McEwen B, de Kloet E, Rostene W. Adrenal steroid receptors and actions in the nervous system. Physiol Rev 1986;66:1121–1189
33. Gilbert ME, Kelly ME, Samsam TE, et al. Chronic developmental lead exposure reduces neurogenesis in adult rat hippocampus but does not

impair spatial learning. Toxicol Sci 2005;86:365–374
34. Bremner JD, Randall P, Vermetten E, et al. Magnetic resonance imaging-based measurement of hippocampal volume in posttraumatic stress disorder related to childhood physical and sexual abuse: a preliminary report. Biol Psychiatry 1997;41:23–32
35. Bremner JD, Randall P, Scott TM, et al. MRI-based measurement of hippocampal volume in patients with combat-related posttraumatic stress disorder. Am J Psychiatry 1995;152:973–981
36. Gurvits TV, Shenton ME, Hokama H, et al. Magnetic resonance imaging study of hippocampal volume in chronic, combat-related posttraumatic stress disorder. Biol Psychiatry 1996;40:1091–1099
37. Stein MB, Koverola C, Hanna C, et al. Hippocampal volume in women victimized by childhood sexual abuse. Psychol Med 1997;27:951–959
38. Kitayama N, Vaccarino V, Kuther M, et al. Magnetic resonance imaging (MRI) measurement of hippocampal volume in posttraumatic stress disorder: a meta-analysis. J Affect Disord 2005;88:79–86
39. Gilbertson MW, Shenton ME, Ciszewski A, et al. Smaller hippocampal volume predicts pathologic vulnerability to psychological trauma. Nat Neurosci 2002;5:1242–1247
40. Rauch SL, van der Kolk BA, Fisler RE, et al. A symptom provocation study of posttraumatic stress disorder using positron emission tomography and script-driven imagery. Arch Gen Psychiatry 1996;53:380–387
41. Bremner JD, Staib LH, Kaloupek D, et al. Neural correlates of exposure to traumatic pictures and sound in Vietnam combat veterans with and without posttraumatic stress disorder: a positron emission tomography study. Biol Psychiatry 1999;45:806–816
42. Shin LM, Kosslyn SM, McNally RJ, et al. Visual imagery and perception in posttraumatic stress disorder: a positron emission tomography study. Arch Gen Psychiatry 1997;54:233–241
43. Kosslyn SM, Alpert NM, Thompson WL, et al. Visual imagery activates topographically organized visual cortex: PET investigations. J Cogn Neurosci 1993;5:263–287
44. Charney DS, Deutch AY, Krystal JH, et al. Psychobiologic mechanisms of posttraumatic stress disorder. Arch Gen Psychiatry 1993;50:295–305
45. Charney DS. Psychobiological mechanisms of resilience and vulnerability: implications for successful adaptation to extreme stress. Am J Psychiatry 2004;161:195–216
46. Hashimoto S, Inoue T, Koyama T. Effects of conditioned fear stress on serotonin neurotransmission and freezing behavior in rats. Eur J Pharmacol 1999;378:23–30
47. Inoue T, Koyama T, Yamashita I. Effect of conditioned fear stress on serotonin metabolism in the rat brain. Pharmacol Biochem Behav 1993; 4:371–374
48. Seedat S, Warwick J, van Heerden B, et al. Single photon emission computed tomography in posttraumatic stress disorder before and after treatment with a selective serotonin reuptake inhibitor. J Affect Disord 2004;80:45–53
49. Rauch SL, Shin LM, Whalen PJ, et al. Neuroimaging and the neuroanatomy of posttraumatic stress disorder. CNS Spectr 1998;7:31–41
50. Vermetten E, Vythilingam M, Southwick SM, et al. Long-term treatment with paroxetine increases verbal declarative memory and hippocampal volume in posttraumatic stress disorder. Biol Psychiatry 2003;54:693–702
51. Rasmussen SA, Eisen JL. Clinical and epidemiologic findings of significance to neuropharmacologic trials in OCD. Psychopharmacol Bull 1988;24:466–470
52. Van Ameringen M, Mancini C, Styan G, et al. Relationship of social phobia with other psychiatric illness. J Affect Disord 1991;21:93–99
53. Brawman-Mintzer O, Lydiard RB. Generalized anxiety disorder: issues in epidemiology. J Clin Psychiatry 1996;57(suppl 7):3–8
54. Stein MB, Kean YM. Disability and quality of life in social phobia: epidemiologic findings. Am J Psychiatry 2000;157:1606–1613
55. Schlenger WE, Caddell JM, Ebert L, et al. Psychological reactions to terrorist attacks: findings from the National Study of Americans' Reactions to September 11. JAMA 2002;288:581–588
56. North CS, Pfefferbaum B. Research on the mental health effects of terrorism. JAMA 2002;288:633–636
57. Prigerson HG, Shear MK, Jacobs SC, et al. Consensus criteria for traumatic grief: a preliminary empirical test. Br J Psychiatry 1999;174:67–73
58. Charney DS, Manji HK. Life stress, genes, and depression: multiple pathways lead to increased risk and new opportunities for intervention. Sci STKE 2004;225:re5
59. Shalev A, Freedman S, Peri T, et al. Prospective study of posttraumatic stress disorder and depression following trauma. Am J Psychiatry 1998; 155:630–637
60. Blanchard EB, Buckley TC, Hickling E, et al. Posttraumatic stress disorder and comorbid major depression: is the correlation an illusion? J Anxiety Disord 1998;2:21–37
61. Deering CG, Glover SG, Ready D, et al. Unique patterns of comorbidity in posttraumatic stress disorder from different sources of trauma. Compr Psychiatry 1996;37:336–346
62. Bremner JD, Southwick SM, Darnell A, et al. Chronic PTSD in Vietnam combat veterans: course of illness and substance abuse. Am J Psychiatry 1996;153:369–375
63. Breslau N, Davis GC, Schultz LR. Posttraumatic stress disorder and the incidence of nicotine, alcohol, and other drug disorders in persons who have experienced trauma. Arch Gen Psychiatry 2003;60:289–294
64. Pfefferbaum B, Vinekar SS, Trautman RP, et al. The effect of loss and trauma on substance use behavior in individuals seeking support services after the 1995 Oklahoma City bombing. Ann Clin Psychiatry 2002;14: 89–95
65. Vlahov D, Galea S, Ahern J, et al. Consumption of cigarettes, alcohol, and marijuana among New York City residents six months after the September 11 terrorist attacks. Am J Drug Alcohol Abuse 2004;30:385–407
66. McFarlane AC. Epidemiological evidence about the relationship between PTSD and alcohol abuse: the nature of the association. Addict Behav 1998;23:813–825
67. McFarlane AC. The longitudinal course of post-traumatic stress disorders following a natural disaster. J Nerv Ment Dis 1988;176:22–29
68. Green BL, Lindy JD, Grace MC, et al. Chronic post-traumatic stress disorder and diagnostic comorbidity in a disaster sample. J Nerv Ment Dis 1992;180:760–766
69. Breslau N. Outcomes of posttraumatic stress disorder. J Clin Psychiatry 2001;62(suppl 17):55–59
70. Andreski P, Chilcoat H, Breslau N. Post-traumatic stress disorder and somatization symptoms: a prospective study. Psychiatry Res 1998;79: 131–138
71. Shalev A, Bleich A, Ursano RJ. Posttraumatic stress disorder: somatic comorbidity and effort tolerance. Psychosomatics 1990;31:197–203
72. McFarlane AC, Atchison M, Rafalowicz E, et al. Physical symptoms in posttraumatic stress disorder. J Psychosom Res 1994;38:715–726

Practical Assessment and Evaluation of Mental Health Problems Following a Mass Disaster

Kathryn M. Connor, M.D.; Edna B. Foa, Ph.D.; and Jonathan R. T. Davidson, M.D.

Almost all individuals who experience a severe trauma will develop symptoms of posttraumatic stress disorder (PTSD) shortly after the traumatic event. Although the natural history of PTSD varies according to the type of trauma, most people do not develop enduring PTSD, and, in many of those who do, it resolves within 1 year without treatment. To the extent that is possible, maintenance of normal daily activities is believed to help patients cope more successfully in the aftermath of major trauma. In the case of a disaster such as the Asian tsunami, the whole community is involved, and it is impossible to continue with normal daily activities. To improve overall outcome after trauma, it would be optimal to identify individuals at increased risk for developing PTSD. This article describes screening and assessment tools for posttrauma mental health problems, particularly PTSD, and examines in more detail instruments that can be used in rapid field assessment of individuals who may be affected or who have already been identified and require monitoring. Self-rated instruments are most appropriate, but the choice of instrument will depend on the local situation and availability of appropriately validated questionnaires. The article also addresses important aspects of training nonmedical personnel in screening and assessment. *(J Clin Psychiatry 2006;67[suppl 2]:26–33)*

It is common, but by no means invariable, for individuals who experience or witness a severe trauma of a threatening nature to initially respond with intense fear, helplessness, or horror followed by anxiety, depression, agitation, shock, or dissociation. Within a few days to weeks, these responses may crystallize as the symptom constellation of posttraumatic stress disorder (PTSD). A diagnosis of PTSD is made if the symptoms persist beyond 1 month after exposure to the trauma. Following trauma exposure, most people do not develop PTSD, and, in those who do, it often resolves within 1 year independent of treatment.[1] In the case of a disaster such as the Asian tsunami, the whole community is involved, and it is impossible to continue with normal daily activities. Special populations such as women and children may be particularly affected.[2] To improve overall outcome after trauma, it would be optimal to be able to identify individuals at increased risk for developing PTSD.

This article describes screening and assessment tools for posttraumatic mental health problems, particularly PTSD, and examines in more detail instruments that can be used in rapid field assessment of individuals who may be affected or who have already been identified and require monitoring. Instruments discussed in this report represent examples of commonly used tools that may be useful in this regard. This report also addresses salient aspects of training nonmedical personnel in screening and assessment of traumatized individuals.

Posttraumatic mental health is influenced by various factors affecting the individual.[3–5] One factor that can hinder recovery is the systematic avoidance of reminders of the incident, including thinking and talking about the event.[6] Previous traumas and the response to them will influence reaction to the immediate trauma, as will personal characteristics such as resilience. The individual's psychosocial situation and internal and external stressors will also have an impact.[7]

CHALLENGES TO THE ASSESSMENT OF TRAUMA SURVIVORS

There are several challenges in assessing posttraumatic mental health disorders related to both patients and healthcare providers. Patients may be reluctant to discuss the trauma. For example, they may be afraid to remember and

From the Department of Psychiatry and Behavioral Science, Duke University Medical Center, Durham, N.C. (Drs. Connor and Davidson), and the Center for the Treatment and Study of Anxiety, Department of Psychiatry, University of Pennsylvania, Philadelphia (Dr. Foa).

Presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and supported by an educational grant from Pfizer Inc.

Corresponding author and reprints: Kathryn M. Connor, M.D., Department of Psychiatry and Behavioral Science, Duke University Medical Center, Durham, NC 27710 (e-mail: conno004@mc.duke.edu).

articulate the details and may have fears for their own safety or for the safety of others after the trauma. In addition, they may feel shame and guilt related to the trauma. For example, tsunami survivors may feel guilt that they survived the experience and shame and/or guilt that they were unable to save others.

Health-care providers themselves may be affected by the trauma, especially in a disaster of the magnitude of the tsunami, or may have a history of trauma that they have not dealt with heretofore. Providers may fail to inquire about the patient's traumatic experiences because they may be personally uncomfortable with the subject matter or perhaps inexperienced in psychological assessments and taking a trauma history, or because of time constraints. In addition, proper diagnosis may be masked by other psychiatric conditions, such as depression, or by somatic symptoms including headache and gastrointestinal problems.

Moreover, cultural issues can impact the assessment of posttraumatic mental health, including patient presentation, as well as patient and provider expectations, interactions, and reactions. These cultural considerations have been well reviewed by Kirmayer,[8] who noted the reluctance of many Japanese patients to acknowledge depression. He presented an 11-point set of elements for a culturally competent clinical formulation. We have also found resistance to discuss early sexual trauma both by subjects and by clinicians in a Taiwanese study of postearthquake reactions.[9]

SCREENING AND ASSESSMENT TOOLS

Screening and assessment tools can be used in different ways. Screening instruments can identify patients at increased risk for developing a variety of mental health problems or a specific disorder. Scales can also serve the following purposes: (1) diagnostic assessment, (2) assessment of disease severity, (3) identification of targets for treatment (e.g., nightmares, intrusion, avoidance, numbing, hyperarousal, comorbidity), (4) monitoring treatment outcome, (5) assessment of resilience, (6) assessment of disability, (7) assessment of quality of life, and (8) measurement of general psychiatric caseness.

There are different types of evaluation tools, which can be divided according to structure or purpose. Instruments may be self-rated or interviewer-rated. Self-rating tests are easy to use and appropriate for rapid screening for possible diagnosis, symptom and function assessment, and treatment monitoring. Although interviewer-administered tests are the gold standard for diagnosis in research, they require trained personnel and are more time-consuming to administer. These considerations make these tests less suitable for rapid field assessment.

Trauma questionnaires may cover a wide range of traumatic events or focus on a specific type of event. Screening instruments help to identify individuals at increased general risk for developing a disorder, while diagnostic assessments are generally specific for a given disorder (e.g., PTSD) or for comorbidities such as depression, generalized anxiety disorder, substance abuse, and suicidality. Outcome can be measured using specific tools or by reapplying diagnostic assessment tools to assess change over time, with or without treatment.

Trauma Questionnaires

The first step in assessment of PTSD is evaluation for the presence of a traumatic event. Following mass disasters, such as the Asian tsunami, the incident trauma may be self-evident. In most instances, however, the trauma may not be readily apparent to the health-care provider. Trauma questionnaires alert health-care providers to the likely occurrence of past trauma, including the type of trauma, whether it was a single or recurring event, the age at time(s) of trauma, and the most distressing trauma. They are used in research to establish the DSM-IV criterion A (the trauma criterion) of PTSD. In clinical practice, trauma questionnaires are used to put the presenting problem (e.g., somatic symptoms, immediate trauma) into a wider context. Although the tsunami survivors have experienced an obvious trauma, they may also have experienced previous trauma(s) that affect their presentation or influence outcome. For example, an adult who experienced a near-fatal drowning as a child may react differently in the aftermath of the tsunami compared to someone without such a childhood history.

There are several widely used trauma questionnaires, including the Trauma Questionnaire (TQ)[10] and Stressful Life Events Screening Questionnaire (SLESQ),[11] both of which cover a general trauma history. The TQ evaluates one's life history of traumatic experiences. This self-assessment includes a list of various types of trauma and identifies the age at each event and the most distressing experience. The SLESQ is another self-report measure designed to assess lifetime exposure to a variety of traumatic events. The SLESQ has solid psychometric properties, with good discrimination between DSM-IV PTSD criterion A (i.e., trauma criterion) and non–criterion A events. The Assault Information and History Interview (AIHI)[12] was developed to obtain details about rape trauma, including relevant background information (for further information, contact Dr. Foa, foa@mail.med.upenn.edu). It has since been revised to encompass all traumas.

A number of PTSD diagnostic scales discussed in detail below (Diagnostic Assessments) also contain modules to address trauma history. For example, the Clinician-Administered PTSD Scale (CAPS)[13] and the Structured Interview for PTSD (SIP)[14] each contain a trauma history panel at the beginning of the interview. Foa and colleagues[15] also include a trauma questionnaire in parts 1 and 2 of the Posttraumatic Diagnostic Scale (PDS)

as well as questions that address all the DSM-IV criteria for PTSD. In contrast with the CAPS, which requires an interview with a clinician, the PDS is a self-report questionnaire.

Screening Assessments

Screening assessments can be an important tool to appropriately target individuals at increased risk of developing a disorder and in need of further investigation. However, it is important to bear in mind that, with the exception of the PDS,[15] these instruments include the assumption that there has been exposure to trauma and that they are not a substitute for a clinical evaluation or clinical diagnosis. Short self-rated screening instruments for PTSD discussed below (Rapid Assessment Tools) include the Trauma Screening Questionnaire (TSQ),[5] Breslau and colleagues' short screening scale,[16] and the SPAN (named for its top 4 items: Startle, Physiological arousal, Anger, Numbing).[17]

The TSQ is a 10-item instrument evaluating DSM-IV PTSD criteria B (reexperiencing) and D (arousal) symptoms[5] that is based on the PDS.[15] Items are rated in a yes/no format as to their occurrence at least twice in the past week. Positive endorsement of at least 6 items has a positive likelihood ratio (PLR = sensitivity/[1–specificity])[18] of 12.3 for PTSD. Of note, the PLR provides an index of the increased likelihood that a condition is present given a positive test result; a score of 3 is considered moderately positive, while 10 is considered strongly positive.[18] The scale's authors did not include items assessing avoidance and numbing (DSM-IV criterion C), owing to the desire to have a brief scale and to concerns that these items are not always well understood by respondents (e.g., amnesia and foreshortened future items).[5]

A 7-item screening instrument derived from 2 widely used structured interviews (i.e., Diagnostic Interview Schedule [DIS] and Composite International Diagnostic Interview [CIDI]) was developed by Breslau et al.[16] Five avoidance and numbing items and 2 arousal items from those interviews were found to have the greatest efficiency for predicting a diagnosis of PTSD. Items are rated in a yes/no format, and a score of 4 positive responses is strongly positive for a PTSD diagnosis (PLR = 26.7). Limitations of this scale include unclear generalizability to all ages (validated in adults aged 18–45 years in the United States) and its validity when used as a self-rating.

The SPAN[17] is a self-rated, 4-item scale derived from the Davidson Trauma Scale (DTS)[19] and includes assessment of avoidance (physiologic upset at reminders), numbing, and arousal symptoms (startle, anger; for further information on the SPAN, contact customerservice@mhs.com). The SPAN evaluates symptom severity over the past week, and optimal efficiency for a diagnosis of PTSD is attained at a cutoff score of 5 or more (PLR = 9.1). The scale enjoys a reasonably broad range of utility. For example, its psychometric properties have been established in the general population and treatment-seeking samples in the United States,[17] as well as in a Taiwanese population[20] and patients in a U.S. gynecology clinic,[21] and it has been used as a screener in a population of Venezuelan flood survivors (see Otero and Njenga in this supplement).

Diagnostic Assessments

Interviewer-based. Comprehensive diagnostic interviews can be used to establish the presence of a disorder. The DIS[22] was developed by the National Institutes of Health to assess psychiatric disorders in the Epidemiologic Catchment Area Study in the 1980s,[23,24] the first epidemiologic survey of mental health. The DIS can be used by trained lay interviewers or clinicians to make psychiatric diagnoses according to various criteria. The DIS has been revised over the years and in its current form (DIS-IV) yields diagnoses on the basis of DSM-IV diagnostic criteria (for further information, see http://epi.wustl.edu/dis/dishome.htm).

The CIDI, an interview derived from the DIS,[25,26] has been developed to address the need for a psychiatric epidemiologic interview with cross-cultural applicability that can provide diagnoses according to both DSM and ICD criteria. The CIDI was used in the U.S. National Comorbidity Survey in the 1990s[27] and has become the most widely used comprehensive diagnostic interview worldwide (for further information, see http://www.who.int/msa/cidi/). Another popular tool in clinical research is the Structured Clinical Interview for DSM-IV (SCID-I),[28] a structured interview for making the major Axis I diagnoses (for further information, see http://www.scid4.org).

A more recent addition to the library of psychiatric diagnostic instruments is the Mini-International Neuropsychiatric Interview (MINI),[29] a short, validated semi-structured psychiatric interview designed to assess 19 separate disorders according to DSM and ICD criteria. The modules for Axis I disorders can be used independently of the full interview, adding a greater measure of clinical utility for this scale.[29]

We should note that, while comprehensive, none of these scales is of much use in rapid field assessment because they require trained personnel and take time to administer (from 20 to > 90 minutes).

A number of interviews have been developed specifically for the evaluation of PTSD. The most widely used of these in PTSD research is the CAPS,[13] which was developed in the Veterans Affairs Medical Center system (for further information, see http://www.ncptsd.va.gov/publications/assessment/caps.html). Several versions of the CAPS exist, based on time period covered and on the diagnostic classification system applied (DSM-III-R, DSM-IV): the current and lifetime diagnostic version, CAPS-1 or CAPS-DX; a 1-week symptom–status version,

Table 1. Psychometric Characteristics of Posttraumatic Stress Disorder (PTSD) Self-Rating Assessment Tools

Self-Rating Tool	Cutoff	Sensitivity	Specificity	Positive Predictive Value	Efficiency
Davidson Trauma Scale[a,b]	40	0.69	0.95	0.92	83%
PTSD Checklist[c,d]	50	0.91	0.40	0.85	80%
Posttraumatic Diagnostic Scale[b,e]	15	0.89	0.75	NA	NA

[a]Data from Davidson et al.[19]
[b]Validated against the Structured Clinical Interview for DSM-IV.
[c]Data from Ventureyra et al.[33] and Walker et al.[34]
[d]Validated against the Clinician-Administered PTSD Scale.
[e]Data from Ventureyra et al.[33]
Abbreviation: NA = not available.

CAPS-2 or CAPS-SX; and a flexible, single-form, 1-week or 1-month version. Each version consists of a trauma questionnaire, followed by 17 interviewer-rated items that cover the B, C, and D criteria for PTSD. Additional items assess frequency and intensity of features often associated with PTSD (e.g., guilt, depression, and homicidality) and provide global ratings that reflect the impact of symptoms on overall functioning. For each of the 17 core PTSD symptom items, the interviewer rates symptom frequency and severity, for a full-scale score of 0 to 136. Thus, the scale provides a range of options for administration and scoring. The CAPS can be used both to assess the presence or absence of PTSD, by determining the number of symptoms present in each cluster, and to measure PTSD symptom severity through the value of the score. Total severity scores can be summed over the 17 core symptoms, with symptom severity evaluated using the following CAPS cutoff scores: 0 to 19, asymptomatic/few symptoms; 20 to 39, mild/subthreshold PTSD; 40 to 59, moderate/threshold PTSD; 60 to 79, severe PTSD; and ≥ 80, extreme PTSD.[13] Weathers et al.[13] propose that a 15-point change in CAPS score indicates clinically significant change.

Alternative and shorter structured interviews have been validated and perform well. These include the PTSD Symptom Scale-Interview (PSS-I)[30] and the SIP.[14] Both scales have acceptable psychometric properties and the advantage of brevity relative to the CAPS. Indeed, the PSS-I has psychometric properties as excellent as those of the CAPS, although it takes just 25 minutes to administer compared with 45 minutes for the CAPS.[31] A third interview, the Short PTSD Rating Interview (SPRINT),[32] has demonstrated reliability and validity as a semistructured interview and as a self-rating instrument (J.R.T.D., unpublished data, June 1, 2005). The scale comprises 8 items that evaluate the core PTSD symptoms, along with other relevant features of somatic malaise, stress coping, and impairment due to symptoms. Two additional items evaluate global severity and change with treatment. Rated over the past month, a score of 14 or greater has a 96% diagnostic accuracy for PTSD.

Self-rated. A number of self-rated instruments have been developed to assist in identifying individuals with PTSD, evaluating symptom severity, and assessing change over time. One extremely popular instrument, which has been translated into numerous languages, is the PDS,[33] comprised of 4 parts that permit identification of the A, B, C, D, and E diagnostic criteria in DSM-IV for PTSD and assessment of change over time (to receive translations of the PDS into various languages, contact Dr. Foa). Additional details of the structure and administration of the PDS are described below (Rapid Assessment Tools).

Another popular self-rating scale is the DTS (for further information on the DTS, contact customerservice@mhs.com).[19] The DTS rates the severity and frequency of 17 core PTSD symptoms over the past week. The full scale scoring range is from 0 to 136. The scale has good psychometric properties and, at a cutoff of 40, has an 83% diagnostic efficiency for a diagnosis of PTSD (PLR = 13.8).

Several other self-rated instruments that can be helpful in evaluating reactions to trauma, but that were not developed to make a diagnosis of PTSD, include the PTSD Checklist[33,34] (PCL; for further information, see http://www.ncptsd.va.gov/publications/assessment/adult_self_report.html), the Impact of Event Scale-Revised[35] (IES-R; for further information, contact Dr. Daniel S. Weiss, dweiss@itsa.ucsf.edu), and the Mississippi Scale for Combat-Related PTSD[36] (for further information, see http://www.ncptsd.va.gov/publications/assessment/adult_self_report.html). While the IES-R includes hyperarousal symptoms, it is less widely used than its established parent, the IES.

All of these instruments have been psychometrically validated. The DTS, PCL, and PDS have good sensitivity and specificity for diagnosing PTSD using appropriate thresholds when validated against the SCID or the CAPS (Table 1). However, none of them has been widely validated linguistically or transculturally.

Other Measures

Other measures that are salient in the assessment of PTSD include measures of stress coping, or resilience, and general psychopathology. One measure of stress coping is the Sheehan Stress Vulnerability Scale (SVS),[37] which is a self-rated assessment that measures vulnerability to the effects of stress. The SVS comprises a 1-item visual analog scale rated from 0 (not at all) to 10 (very severely) to answer the question, "In the past week, how much were you set back by stressful events or personal problems, such as

Table 2. Summary of Self-Rated Instruments for Rapid Assessment of Posttrauma Mental Health Problems in the Field

Comparator	TSQ[a]	PDS Part 3[b]	CD-RISC-2[c]	GHQ-12[d]
Used to	Identify patients at risk for PTSD	Diagnose PTSD Assess changes over time	Assess resilience	Assess general psychopathology
Assesses	PTSD symptoms	Frequency/severity of core PTSD symptoms	Adaptability to change, and "bouncing back" after adversity	General psychopathology
Period covered	Past week	Past month	Past month	Last few weeks
Items, N	10	17	2	12
Score				
Range	0–10	0–51	0–8	0–12
General population	0–5	0–14	6–7	0–2
Cutoff for PTSD	6	15	< 5	3

[a]Data from Brewin et al.[5]
[b]Data from Ventureyra et al.[33]
[c]Data from Connor and Davidson.[39]
[d]Data from Goldberg.[40]
Abbreviations: CD-RISC-2 = 2-item Connor-Davidson Resilience Scale, GHQ-12 = 12-item General Health Questionnaire, PDS = Posttraumatic Diagnostic Scale, PTSD = posttraumatic stress disorder, TSQ = Trauma Screening Questionnaire.

work, home, social, health, or social problems?" Higher scores are associated with greater impairment. The SVS can be applied in a variety of clinical situations, and, although scores are generally higher in patients with PTSD than those with other anxiety disorders, a lower score reflecting improved functioning and quality of life can be observed after effective treatment.[38]

A more recently developed measure to evaluate resilience is the Connor-Davidson Resilience Scale (CD-RISC),[39] a 25-item self-rated scale that assesses characteristics of psychological resilience over the last month. Higher scores are associated with greater resilience, and scores have been shown to improve with treatment. The CD-RISC has been validated in a general U.S. population and various clinical populations in the United States. The general population mean score is 80, and lower scores have been observed in patients with depression and anxiety disorders, with the lowest scores in individuals with PTSD (mean 55–60).[39] A brief 2-item version of the CD-RISC (CD-RISC-2) is highly associated with PTSD and is responsive to change during treatment (J.R.T.D., unpublished data, January 1, 2005; see CD-RISC-2 under Rapid Assessment Tools).

Of the many self-ratings developed that evaluate general psychopathology, 2 of the most widely used measures in the field are the General Health Questionnaire (GHQ; see Rapid Assessment Tools)[40] and the Symptom Checklist-90 (SCL-90).[41] Several versions of the GHQ are available, including 12-, 28-, 30-, and 60-item versions. The shortest of the 4 versions, the GHQ-12, enjoys a degree of international and cross-cultural robustness. Additional details about the structure and administration of the GHQ-12 are provided below. The SCL-90-R, a widely used self-rated questionnaire,[42] assesses 90 items in 9 subscales (somatization, depression, phobic anxiety, obsessive-compulsive, anxiety, paranoid ideation, interpersonal sensitivity, hostility, and psychoticism) and 3 global measures (for further information, see http://www.pearsonassessments.com/tests/scl90r.htm). A shorter version with 53 items is available. An earlier version of the SCL, the SCL-90, is also in the public domain, with little to distinguish it from the SCL-90-R.

RAPID ASSESSMENT TOOLS

Following a large-scale disaster, such as a tsunami, community resources are often limited, and rapid assessment of large groups of survivors is often necessary to triage those in greatest need of referral to available resources. The goals of rapid assessment following a trauma are to evaluate levels of distress, impairment, and safety. This evaluation includes, but is not limited to, assessment for posttraumatic stress symptoms, coping strategies, suicidality, and alcohol and drug use, as well as an evaluation of the trauma's impact on meeting one's daily needs and on available supports.

Examples of self-rated instruments that can facilitate rapid assessment include the TSQ, PDS, CD-RISC-2, and the GHQ. Features of these scales are summarized in Table 2. Of note, although all these assessment tools have been validated in the cultures and languages in which they were developed, only the GHQ-12 and, to a lesser extent, the SPAN have been validated in multiple cultures, settings, and languages.[43]

Trauma Screening Questionnaire

As most people who experience a traumatic event do not develop PTSD, it is important to identify those individuals who are at greatest risk and who need further evaluation. The TSQ, discussed above (Screening Assessments), is a useful screening tool in this regard (for further information, contact Dr. Foa).

Posttraumatic Diagnostic Scale

The PDS is a widely used self-report screening instrument comprised of 4 parts: (1) a trauma history, (2) a de-

tailed history of the most distressing event, (3) 17 items assessing the frequency of core PTSD symptoms over the past month, and (4) assessment of distress and functional impairment due to symptoms.[33] (For further information, see http://www.pearsonassessments.com/tests/pds.htm.) A tsunami-specific version is available that refers to the tsunami in the instructions rather than to an unspecified trauma (E.B.F., unpublished data, June 29, 2005).

In the aftermath of a mass disaster, the incident trauma is well established, and it may not be necessary to complete the trauma history covered in parts 1 and 2 of the PDS. However, one should remember that obtaining an individual's life history of traumatic events (part 1) can help to place the trauma due to the disaster into context for that person. Similarly, information collected in part 2 may help to illuminate the extent of trauma caused by the disaster (e.g., events within the disaster itself, death of loved ones, loss of home, loss of job, and loss of community).

Part 3 provides a diagnostic assessment for PTSD and includes 17 items assessing the frequency of occurrence of the core DSM-IV PTSD symptoms in the past month: 5 related to reexperiencing, 7 to avoidance and numbing, and 5 to arousal. Each item is rated from 0 to 3, for a total possible score of 0 to 51. Using a cutoff of 15, individuals are diagnosed with PTSD across a range from mild (score 15–19) to severe disease (score > 30). Patients whose scores have improved to less than 10 are said to be in remission.

Part 4 assesses impairment in various aspects of daily life (work, household duties, friendships, leisure activities, schoolwork, family relationships, sex life, general satisfaction with life, and overall level of functioning) using a yes/no format. Information in this section can be useful in evaluating the current impact of symptoms on overall functioning, as well as in assessing change over time.

For rapid assessment in the field, when the trauma is known, parts 3 and 4 of the PDS may be sufficient.

Connor-Davidson Resilience Scale 2

A 2-item version of the CD-RISC (CD-RISC-2) provides a brief assessment of resilience over the past month.[39] Features of resilience evaluated are adaptability to change and the ability to bounce back after adversity, both of which were strongly associated with PTSD and were responsive to change (over time and with treatment), in the 25-item version.[44] Each item is rated from 0 (not at all) to 4 (true nearly all the time), and higher scores are associated with greater resilience. In the general U.S. population, the average score is 6 to 7; a score of 4 or less is often found in PTSD. The CD-RISC-2 can also be used to assess the ongoing impact of the tsunami on a victim's ability to cope. While the full 25-item CD-RISC has been well validated, the same cannot yet be said for the short 2-item version, but efforts to do so are underway.

General Health Questionnaire, 12-Item Version

A shortened version of the GHQ, the GHQ-12,[40] has broad clinical utility. The GHQ-12 has been validated in a variety of cultures and languages,[38] and the best cutoff score to achieve optimum sensitivity and specificity has been found to vary considerably from one setting to another.[45,46] To address this problem of variability across setting, several investigators have suggested using stratum-specific likelihood ratios (SSLR) in place of fixed cutoff scores.[46] The SSLR expresses the probability that a given level of a diagnostic test result would be expected in a patient with the target disorder, such that an SSLR of 10 makes the target disorder highly probable, while an SSLR of less than 0.1 rules it out. The GHQ-12 is rated over the past few weeks, with each item scored from 0 to 3. Responses are dichotomized, whereby ratings of 0 or 1 are coded as "0" and ratings of 2 or 3 as "1." An overall GHQ-12 score of 7 or greater (SSLR = 11.5) indicates a high probability of clinically significant psychopathology that warrants further evaluation.[46]

Screening for Alcohol Problems

In the aftermath of trauma, some survivors will turn to alcohol consumption and other drug use in an effort to alleviate their distress. Individuals with preexisting problems with substance abuse or dependence are at greater risk for relapse following traumatic events. For example, following the September 11 terrorist attacks in New York City, a substantial increase in alcohol use was observed (25%), with the greatest increase reported in those who already consumed alcohol.[47]

It is therefore important to screen for substance use problems in trauma survivors. One widely used tool to assess for clinically significant alcohol problems is the CAGE.[48] The 4 self-rated items are scored in a yes/no format, and 2 or more positive responses are considered clinically significant and warrant further clinical evaluation.

TRAINING NONMEDICAL PROVIDERS

After a major disaster, infrastructure can be devastated, and health-care providers are often personally affected. These realities have implications for the health-care workers' ability to provide care to others. Under such circumstances, it may be necessary to draft nonmedical volunteers to provide health services, including mental health care.

The experience of the Armenian earthquake in 1988 shows that volunteer therapists need to be screened carefully and given appropriate training.[49] In selecting such paraprofessionals following the earthquake, Goenjian[49] found it important to identify those with motivation, greater maturity, less anxiety, and a positive/appropriate personal response to trauma and loss. It was also important to prepare them for the difficulties that they would face

(both mental health issues and physical hardship) and to show them how to deal with their own experiences and help others do the same.[49] However, the training options can be limited by the abilities of the selected individuals. Careful thought should be given to the extent to which untrained individuals enlisted as care providers can make decisions and use scales. To address this in depth, however, would be beyond the scope of this article; instead, we refer readers to the work of Goenjian[49] and van de Put.[50]

SUMMARY AND CONCLUSION

It is important to identify individuals at increased risk for mental health problems after a major disaster, to diagnose those problems, and to monitor the results of treatment. Self-rated instruments are most appropriate for rapid screening and assessment, and several are available. Examples of instruments suitable for rapid use in the field have been described. However, the choice of instrument will depend on the local situation and availability of locally validated questionnaires. This dependence could provide an opportunity to validate a wider range of instruments for local use.

Assessments and outcome measures may need to be repeated at intervals, depending on context, e.g., to identify persisting posttraumatic reactions or to monitor recovery.

In previous disasters, nonmedical personnel were used to provide care in situations in which the normal healthcare infrastructure was overstretched. Such models can be adapted according to local need.

In conclusion, suitable self-rated screening and assessment tools are available to identify, diagnose, and monitor PTSD patients after a major disaster such as the Asian tsunami. However, further work is required to validate these tools culturally and linguistically.

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling has been presented in this article.

REFERENCES

1. Rothbaum BO, Foa EB. Subtypes of posttraumatic stress disorder and duration of symptoms. In: Davidson JRT, Foa EB, eds. Posttraumatic Stress Disorder: DSM-IV and Beyond. Washington, DC: American Psychiatric Press; 1993:23–35
2. Somasundaram DJ, van de Put WA, Eisenbruch M, et al. Starting mental health services in Cambodia. Soc Sci Med 1999;48:1029–1046
3. Connor KM, Butterfield MI. Posttraumatic stress disorder. Focus 2003;1:247–262
4. American Psychiatric Association. Practice Guideline for the Treatment of Patients With Acute Stress Disorder and Posttraumatic Stress Disorder. Am J Psychiatry 2004;161(suppl 11):3–31
5. Brewin CR, Rose S, Andrews B, et al. Brief screening instrument for post-traumatic stress disorder. Br J Psychiatry 2002;181:158–162
6. Foa EB. Psychological processes related to recovery from a trauma and an effective treatment for PTSD. Ann N Y Acad Sci 1997;821:410–424
7. Brewin CR, Holmes EA. Psychological theories of posttraumatic stress disorder. Clin Psychol Rev 2003;23:339–376
8. Kirmayer L. Cultural variations in the clinical presentation of depression and anxiety: implications for diagnosis and treatment. J Clin Psychiatry 2001;62(suppl 13):22–28
9. Lai TJ, Chang CM, Connor KM, et al. Full and partial PTSD among earthquake survivors in rural Taiwan. J Psychiatr Res 2004;38:313–322
10. Escalona R, Tupler LA, Saur CD, et al. Screening for trauma history on an inpatient affective-disorders unit: a pilot study. J Trauma Stress 1997;10:299–305
11. Goodman LA, Corcoran C, Turner K, et al. Assessing traumatic event exposure: general issues and preliminary findings for the Stressful Life Events Screening Questionnaire. J Trauma Stress 1998;11:521–542
12. Foa EB, Rothbaum BO. Treating the Trauma of Rape: Cognitive-Behavioral Therapy for PTSD. New York, NY: Guilford Press; 1998:1–13
13. Weathers FW, Keane TM, Davidson JR. Clinician-Administered PTSD Scale: a review of the first ten years of research. Depress Anxiety 2001; 13:132–156
14. Davidson JR, Malik MA, Travers J. Structured Interview for PTSD (SIP): psychometric validation for DSM-IV criteria. Depress Anxiety 1997;5: 127–129
15. Foa EB, Cashman L, Jaycox L, et al. The validation of a self-report measure of posttraumatic stress disorder: the Posttraumatic Diagnostic Scale. Psychol Assess 1997;9:445–451
16. Breslau N, Peterson EL, Kessler RC, et al. Short screening scale for DSM-IV posttraumatic stress disorder. Am J Psychiatry 1999;156: 908–911
17. Meltzer-Brody S, Churchill E, Davidson JR. Derivation of the SPAN, a brief diagnostic screening test for post-traumatic stress disorder. Psychiatry Res 1999;88:63–70
18. Rampes H, Warner JP, Blizard R. How to appraise an article on diagnosis. Psychiatr Bull 1998;22:506–509
19. Davidson JR, Book SW, Colket JT, et al. Assessment of a new self-rating scale for post-traumatic stress disorder. Psychol Med 1997;27:153–160
20. Chen CH, Shen WW, Tan HK, et al. The validation study and application of stratum-specific likelihood ratios in the Chinese version of SPAN. Compr Psychiatry 2003;44:78–81
21. Meltzer-Brody S, Hartmann K, Miller WC, et al. A brief screening instrument to detect posttraumatic stress disorder in outpatient gynecology. Obstet Gynecol 2004;104:770–776
22. Robins LN, Cotter L, Bucholz K, et al. Diagnostic Interview Schedule for DSM-IV. St Louis, Mo: Washington University; 1995
23. Helzer JE, Robins LN, McEvoy L. Post-traumatic stress disorder in the general population: findings of the Epidemiologic Catchment Area survey. N Engl J Med 1987;317:1630–1634
24. Davidson JR, Hughes D, Blazer DG, et al. Post-traumatic stress disorder in the community: an epidemiological study. Psychol Med 1991;21: 713–721
25. Robins LN, Wing J, Wittchen HU, et al. The Composite International Diagnostic Interview: an epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. Arch Gen Psychiatry 1988;45:1069–1077
26. World Health Organization. Composite International Diagnostic Interview (CIDI), version 2.1. Geneva, Switzerland: World Health Organization; 1997
27. Kessler RC, Sonnega A, Bromet E, et al. Posttraumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 1995;52: 1048–1060
28. Structured Clinical Interview for DSM-IV-TR (SCID). SCID home page. Available at: http://www.scid4.org/. Accessed on July 6, 2005
29. Sheehan DV, Lecrubier Y, Sheehan KH, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J Clin Psychiatry 1998;59(suppl 20):22–33
30. Foa EB, Riggs DS, Dancu CV, et al. Reliability and validity of a brief instrument for assessing posttraumatic stress disorder. J Trauma Stress 1993;6:459–473
31. Foa EB, Tolin DF. Comparison of the PTSD Symptom Scale-Interview Version and the Clinician-Administered PTSD Scale. J Trauma Stess 2000;13:181–191
32. Connor KM, Davidson JR. SPRINT: a brief global assessment of post-traumatic stress disorder. Int Clin Psychopharmacol 2001;16:279–284
33. Ventureyra VA, Yao SN, Cottraux J, et al. The validation of the Posttraumatic Stress Disorder Checklist Scale in posttraumatic stress disorder and nonclinical subjects. Psychother Psychosom 2002;71:47–53
34. Walker EA, Newman E, Dobie DJ, et al. Validation of the PTSD Check-

list in an HMO sample of women. Gen Hosp Psychiatry 2002;24:375–380
35. Weiss DS, Marmar CR. The Impact of Event Scale-Revised. In: Wilson JP, Keane T, eds. Assessing Psychological Trauma and PTSD. New York, NY: Guilford Press; 1996:399–411
36. Keane TM, Caddell JM, Taylor KL. Mississippi Scale for Combat-Related Posttraumatic Stress Disorder: three studies in reliability and validity. J Consult Clin Psychol 1988;56:85–90
37. Sheehan DV, Raj AB, Sheehan KH, et al. Is buspirone effective for panic disorder? J Clin Psychopharmacol 1990;10:3–11
38. Connor KM, Sutherland SM, Tupler LA, et al. Fluoxetine in post-traumatic stress disorder: randomised, double-blind study. Br J Psychiatry 1999;175:17–22
39. Connor KM, Davidson JR. Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). Depress Anxiety 2003;18:76–82
40. Goldberg D. Manual of the General Health Questionnaire. Windsor, UK: National Foundation for Educational Research; 1978
41. Derogatis LR, Lipman RS, Covi L. SCL-90: an outpatient psychiatric rating scale-preliminary report. Psychopharmacol Bull 1973;9:13–28
42. Peveler RC, Fairburn CG. Measurement of neurotic symptoms by self-report questionnaire: validity of the SCL-90R. Psychol Med 1990;20:873–879
43. Ustun B, Sartorius N. Mental Illness in General Health Care: An International Study. Chichester, UK: John Wiley; 1995
44. Davidson JR, Payne VM, Connor KM, et al. Trauma, resilience and saliostasis: effects of treatment in post-traumatic stress disorder. Int Clin Psychopharmacol 2005;20:43–48
45. Goldberg DP, Gater R, Sartorius N, et al. The validity of two versions of the GHQ in the WHO study of mental illness in general health care. Psychol Med 1997;27:191–197
46. Furukawa T, Goldberg DP. Cultural invariance of likelihood ratios for the General Health Questionnaire [letter]. Lancet 1999;353:561–562
47. Marshall RD. If we had known then what we know now: a review of local and national surveys following September 11, 2001. CNS Spectr 2002;7: 645–649
48. Ewing JA. Detecting alcoholism: the CAGE questionnaire. JAMA 1984;252:1905–1907
49. Goenjian A. A mental health relief programme in Armenia after the 1988 earthquake: implementation and clinical observations. Br J Psychiatry 1993;163:230–239
50. van de Put W. Addressing mental health in Afghanistan. Lancet 2002;360(suppl):s41–s42

Pharmacologic Treatment of Acute and Chronic Stress Following Trauma: 2006

Jonathan R. T. Davidson, M.D.

This article reviews pharmacologic treatment options for posttraumatic stress disorder (PTSD), focusing on goals of pharmacotherapy and the clinical trial evidence for drug treatments available for PTSD. The selective serotonin reuptake inhibitors (SSRIs) are recommended as first-line therapy for PTSD; the roles of these and other drug classes including anticonvulsants, mood enhancers, atypical antipsychotic agents, benzodiazepines, α_1-adrenergic antagonists, and β-blockers in achieving improvement in PTSD symptom and outcome scores, achieving remission, and avoiding relapse are discussed. Treatment of PTSD in association with other comorbid conditions is addressed, and the role of pharmacotherapy in treating early PTSD and acute stress disorder is examined. Dosing strategies for the SSRIs sertraline and paroxetine are provided, and an algorithm for PTSD pharmacotherapy is discussed.
(J Clin Psychiatry 2006;67[suppl 2]:34–39)

Posttraumatic stress disorder (PTSD) can be a severe, chronic, and disabling condition with major consequences for the individual and society in terms of morbidity, mortality, impact on economic productivity, and health-care/welfare costs. Effective treatment is critical, and it is fortunate that well-controlled, double-blind trials over the past decade have demonstrated superiority of selective serotonin reuptake inhibitor (SSRI) drugs over placebo. It is reasonable to believe that the use of these, and related compounds, can become an effective tool in promoting the long-term psychological and psychosocial health, and economic recovery, of those in the region affected by the tsunami on December 26, 2004.

PRINCIPAL GOALS OF PHARMACOTHERAPY FOR PTSD

The objectives of medical treatment for PTSD are to reduce its core symptoms (i.e., reexperiencing via intrusive thoughts, nightmares, and flashbacks; avoidance of trauma-related situations and activities; emotional numbing; and hyperarousal); to improve function, including social functioning; to strengthen resilience, or the ability to cope and thrive in adversity; to relieve comorbid disorders commonly associated with PTSD, including depression and panic disorder; and to prevent relapse. While there is no single gold standard by which outcomes in PTSD treatment are measured, scales such as the Davidson Trauma Scale,[1] the Clinician-Administered PTSD Scale (CAPS),[2] the Short PTSD Rating Interview (SPRINT),[3] and the 8-item Treatment Outcome Posttraumatic Stress Disorder Scale (TOP-8)[4] provide measures by which the changes achieved by pharmacotherapy can be quantified.

FIRST-LINE PHARMACOLOGIC TREATMENT OPTIONS FOR PTSD

The SSRIs are currently recommended as first-line therapy for the treatment of PTSD,[5] and the SSRIs sertraline and paroxetine are licensed for treatment of PTSD in the United States and elsewhere. Following recognition of PTSD as a distinct clinical entity in the 1980s, efficacy data from well-controlled, double-blind trials of pharmacotherapy were initially slow to accumulate, but have become available more recently. SSRIs are effective across all PTSD symptom clusters and improve quality of life and functional impairment, though sleep disturbances and nightmares may respond less well in some cases.[6,7]

Acute Efficacy Studies

Fluoxetine. Three randomized, double-blind, placebo-controlled trials[8–10] have confirmed a significantly higher response in patients with PTSD receiving fluoxetine versus placebo for up to 3 months. In a 5-week study[8] com-

From the Department of Psychiatry and Behavioral Science, Duke University Medical Center, Durham, N.C.
Presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and supported by an educational grant from Pfizer Inc.
Corresponding author and reprints: Jonathan R. T. Davidson, M.D., Department of Psychiatry and Behavioral Science, Duke University Medical Center, Durham, NC 27710 (e-mail: jonathan.davidson@duke.edu).

paring fluoxetine at up to 60 mg per day (N = 33) versus placebo (N = 31), fluoxetine significantly reduced overall PTSD symptomatology assessed using CAPS-2 ($p = .01$). Changes were most marked in the arousal and numbing symptom subcategories. A 12-week trial[9] comparing fluoxetine up to 60 mg per day (N = 27) versus placebo (N = 27) demonstrated that fluoxetine was more effective on most measures using the Duke Global Rating for Post-Traumatic Stress Disorder and the Structured Interview PTSD measure at week 12, including global improvement ($p < .06$), with the effects of therapy evident using the Duke scale as early as week 2. In a larger-scale, 12-week study[10] comparing fluoxetine at 20 to 80 mg per day (N = 226) and placebo (N = 75), fluoxetine was associated with a greater improvement from baseline in TOP-8 scale total score versus placebo at week 12 ($p = .006$).

Paroxetine. A 12-week study[11] comparing paroxetine (20–50 mg per day; N = 151) and placebo (N = 156) showed significantly greater improvement in CAPS-2 total score from baseline beginning at week 4 ($p < .05$ vs. placebo), with significantly greater proportions of paroxetine-treated patients achieving a response ($p < .001$ vs. placebo) and remission ($p = .008$) by week 12 on the Clinical Global Impressions-Improvement scale. In a second 12-week study[12] comparing paroxetine 20 mg per day (N = 183), 40 mg per day (N = 182), and placebo (N = 186), paroxetine-treated patients in both dose groups demonstrated significantly greater improvement on the CAPS-2 ($p < .001$). A pooled analysis of these trials plus a third 12-week, placebo-controlled study of paroxetine confirmed that treatment resulted in significantly better response and remission rates, improvement in sleep disturbance, and a reduction in symptom clusters in PTSD compared with placebo.[13]

Sertraline. A 12-week study[14] with sertraline at 50 to 200 mg per day (N = 94) versus placebo (N = 93) showed that sertraline produced a significantly greater improvement from baseline at endpoint in CAPS-2 total score ($p = .02$). In a second 12-week study[15] with sertraline (50–200 mg per day; N = 100) or placebo (N = 108), Davidson et al. reported significantly greater benefit for this drug, relative to placebo, on most measures.

EFFECTS ON RESILIENCE

Treatment with fluoxetine and sertraline and with the serotonin/norepinephrine reuptake inhibitor (SNRI) venlafaxine extended release (XR) has been shown to improve resilience in PTSD patients. Open-label treatment with fluoxetine (N = 25) and sertraline (N = 54) resulted in significant changes from baseline in Connor-Davidson Resilience Scale (CD-RISC) scores ($p < .001$ and $p < .0001$, respectively).[7] A long-term (24-week) study[16] comparing the effects of venlafaxine (N = 151) and placebo (N = 161) on all aspects of PTSD showed a resilience-enhancing effect, as well as overall benefit in PTSD: a significantly greater improvement in CD-RISC scores was seen at endpoint for venlafaxine XR versus placebo ($p < .05$).

TIME TO ONSET OF TREATMENT EFFECT AND LONG-TERM TREATMENT WITH SSRIs

Early onset of action of SSRI therapy in PTSD was confirmed by a study featuring mixed-models analysis of 2 twelve-week, placebo-controlled trials of sertraline treatment.[17] Sertraline was found to markedly improve anger by week 1, an effect that was sustained throughout the remainder of the treatment period and that largely explained the ensuing improvement on intrusive symptoms. Other symptoms improved later, such as emotional upset at reminders, anhedonia, and detachment at week 6 and avoidance of trauma-related activities by week 10. While it is clear that onset of SSRI action may be rapid, and the majority of SSRI efficacy trials in PTSD have been of 3 months' duration or less, short-term therapy is insufficient for full recovery, and optimal results may not be seen until after 6 to 9 months of treatment.

There is evidence that continuation of SSRI therapy brings about sustained improvement in PTSD: in an open-label continuation phase of a 12-week acute study,[18] patients treated with sertraline showed continued improvement up to 9 months. The mean CAPS-2 score was reduced from 45 (representing mild PTSD) at 3 months to 20 (equivalent to minimal or no PTSD symptoms and high-end functional state) at 9 months.

OTHER TREATMENT OPTIONS

The noradrenergic and specific serotonergic antidepressant mirtazapine was effective in treating PTSD in an 8-week, placebo-controlled, double-blind pilot study (N = 29) in which response rates on the Short Posttraumatic Stress Disorder Rating Interview Global Improvement measure were 60% for mirtazapine versus 22% for placebo ($p < .05$).[19] Mirtazapine also helps to alleviate sleep disturbance in PTSD patients; its main disadvantages are side effects of weight gain and somnolence.

The SNRI venlafaxine XR has demonstrated efficacy in PTSD.[16,20]

Mood stabilizers and anticonvulsants can also be useful for treating PTSD symptoms. There is, however, a limited database regarding their efficacy and safety; most published studies are open label, and as these agents produce troublesome or serious side effects or require closer monitoring, they should be classed as second- or third-line treatments. In a small double-blind trial of lamotrigine in 1999, Hertzberg et al.[21] showed preliminary evidence, based on 1 out of several rating measures, that lamotrigine may be effective. A single-center trial of topiramate and

placebo presented by Tucker[22] provided mixed but encouraging results for the drug. Carbamazepine and divalproex sodium both require regular blood tests, and topiramate produces cognitive side effects. One positive, placebo-controlled trial of nefazodone exists,[23] as does a negative placebo-controlled study of bupropion.[24] Interestingly, bupropion appeared to aggravate dissociative symptoms. Both of these trials by Davis and colleagues[23,24] were conducted in combat veterans.

There is a growing literature on the use of atypical antipsychotic agents as adjunctive therapy in PTSD. Olanzapine was shown to be a successful adjunct treatment in a study population with combat-related PTSD who were nonresponsive to 12 weeks of SSRI therapy.[25] Patients who received adjunctive olanzapine for a further 8 weeks (N = 19) showed greater improvement in CAPS-2 scores ($p < .05$) and sleep disorder symptoms (assessed by the Pittsburgh Sleep Questionnaire; $p = .01$) than those who were given placebo.

Similarly, Bartzokis et al.[26] showed that the use of adjunctive risperidone in combat veterans with PTSD achieved significantly better improvement than placebo in a broad range of psychiatric symptoms as measured by the CAPS-total scale and subscales (reexperiencing, avoidance, and arousal). In a 5-week, double-blind, placebo-controlled trial of 40 combat veterans, those receiving adjunctive risperidone showed a significantly greater improvement in psychotic symptoms, measured by the Positive and Negative Syndrome Scale, than those given placebo ($p < .05$), as well as a greater improvement in CAPS reexperiencing subscale score at the study endpoint ($p < .05$).[27] The potential risk of side effects with the atypical antipsychotic agents, including weight gain, postural hypotension, extrapyramidal symptoms, hyperglycemia, and diabetes,[28] does however need to be taken into account when selecting therapy.

Several studies have demonstrated the efficacy of the α_1-adrenergic antagonist prazosin in PTSD. In a 20-week, placebo-controlled crossover, add-on study of Vietnam veterans, in which participants received a mean dose of 9.5 mg per day of prazosin (N = 10) or placebo (N = 10), prazosin produced a greater improvement in nightmares, sleep disturbance, and global change in PTSD severity and functional status than placebo, measured using CAPS and Clinical Global Impression of Change scale (CGIC).[29] Total score and symptom cluster scores for reexperiencing, avoidance/numbing, and hyperarousal were also significantly more improved with prazosin. In a small 6-week, open-label trial involving non–combat-related PTSD, in which 5 individuals received prazosin at increasing doses, all subjects experienced moderate-to-marked improvement on the CGIC, as well as an improvement in Clinical Impression of Change-Nightmares score and CAPS One Week Symptom Version PTSD nightmare and sleep category scores.[30]

Psychotherapy has been shown to benefit patients with only a partial response to SSRIs. In a psychotherapy augmentation study, 60 patients received sertraline for 10 weeks.[31] Those not achieving complete clinical remission were randomly assigned to receive 10 sessions of prolonged exposure therapy over a further 5 weeks in addition to sertraline or to receive drug alone. Patients who initially showed only a partial response benefited greatly from the addition of prolonged exposure therapy to sertraline treatment.

ACHIEVING REMISSION IN PTSD

Although SSRIs are recommended as first-line therapy for PTSD, approximately 20% to 40% of PTSD patients fail to respond to treatment as well as one might hope. Remission rates with SSRIs after 12 weeks are relatively low, at 30% or less,[32] though better than might be expected given the severity and chronic nature of PTSD. Many patients discontinue SSRIs because of side effects, including gastrointestinal symptoms, sleep impairment, agitation, insomnia, sexual side effects, and weight gain. As many as half of all U.S. patients stop taking antidepressants within 3 to 4 months of initiating therapy,[33] for a variety of reasons including cultural and social factors, and this impacts negatively on response and remission rates in PTSD.

One strategy to move PTSD patients from partial response to full response, and to achieve higher remission rates, is long-term drug therapy.[34,35] Treatment can also be augmented with another drug or with psychotherapy, and high side effect rates can be avoided by using a low starting dose and titrating steadily upward. Physicians can encourage patients to persist with taking their medication by providing them with information and education on PTSD and the treatment options.

PREVENTION OF PTSD RELAPSE

SSRI therapy appears to protect against PTSD relapse. When a 6-month, open-label study with fluoxetine was followed by 6 months of double-blind, randomized treatment with fluoxetine or placebo, 50% of patients receiving placebo suffered a major relapse versus 22% treated with fluoxetine ($p < .05$).[36] In a relapse prevention study with sertraline, patients who completed a 12-week, double-blind, placebo-controlled study and a subsequent 24-week, open-label continuation phase were randomly assigned to 28 weeks of maintenance treatment with sertraline (N = 46) or placebo (N = 50).[37] The rates of relapse (including discontinuation due to clinical deterioration) were 48% with placebo versus only 16% with sertraline ($p = .005$). In a double-blind, placebo-controlled study of positive responders to 12 weeks of fluoxetine treatment, patients randomly assigned to receive a further 24 weeks of fluoxetine therapy (N = 69) were found to be

less likely to relapse than those given placebo (N = 62; p = .027).[38]

It is currently recommended that treatment should be tried initially for at least 3 months,[5,38] with effective pharmacotherapy continued for at least 1 year. Discontinuing medication after 6 months exposes patients to a higher risk of relapse. There are currently no published PTSD relapse prevention studies using agents other than SSRIs.

COMORBIDITY IN PTSD

Because PTSD is commonly associated with other psychiatric disorders,[39] and because the SSRIs are recognized as effective broad-spectrum therapy for depression and anxiety disorders, it was expected that these drugs would be effective in treating PTSD with some comorbid conditions. Acute, randomized, double-blind, placebo-controlled studies indicate that both sertraline[40] and paroxetine[13] are effective in treating PTSD both with and without depression, anxiety, or both. An early open-label trial with sertraline (N = 9) suggested that it was effective in treating PTSD in patients with alcohol dependence, with participants showing decreased alcohol consumption.[41] A subsequent 12-week placebo-controlled trial with sertraline in 94 patients failed to show an overall benefit for sertraline, but suggested in a post hoc analysis the possibility that there may be subgroups who respond better to sertraline; those with less severe alcohol dependence and later-onset PTSD had significantly fewer drinks per drinking day (p < .001).[42]

DOSING STRATEGIES

SSRIs should be initiated at a low dose, with slow titration (up to the maximal daily dose if required) until a good response or remission is achieved, or until side effects prevent further dose increases. If side effects are troublesome and the response is poor, other agents should be considered. Suggested dose titration schedules for sertraline and paroxetine are shown in Table 1.

PHARMACOLOGIC PREVENTION OF ACUTE STRESS DISORDER OR EARLY PTSD

Very few studies have investigated pharmacologic prevention of acute stress disorder (ASD) or early PTSD (i.e., occurring within 1 month of trauma). One study[43] in children suggests that short-term antidepressant therapy may be helpful in ASD or early PTSD. In a prospective, randomized, double-blind pilot study in children with severe burns and ASD, treatment with the tricyclic antidepressant imipramine at 1 mg/kg for just 1 week produced an 83% response rate, versus only 38% for control patients who received chloral hydrate to assist sleep.[43] It is unknown for how long successful treatment of ASD should be continued. If symptoms return, then it is advisable to continue treatment for a longer period.

Table 1. Suggested Dose Titration for Sertraline and Paroxetine in Posttraumatic Stress Disorder

	Recommended Dose (mg/d)	
Week	Sertraline	Paroxetine
1	25	10
2	50	20
3	100	30
4–6	150	40
8	200	50

Two studies, one randomized[44] and the other nonrandomized,[45] suggest that treatment with the β-blocker drug propranolol immediately after trauma might prevent some symptoms of PTSD, such as hyperarousal in response to traumatic memories, but may not prevent PTSD overall. Further larger-scale studies are required.

Benzodiazepines are useful in controlling anxiety and agitation and assisting sleep. They are not particularly effective in ASD, however, and may impair learning in a clinical situation and have withdrawal symptoms.[5] They are therefore not recommended for ASD or early PTSD. In 6-week and 6-month studies in trauma patients, more than twice as many patients receiving benzodiazepine still had PTSD compared with controls receiving no treatment or placebo, suggesting a harmful effect (although it is important to remember that assignment to treatment was not randomized in 1 trial, thus leaving open the possibility of important confounding differences between the groups).[46,47] Hypnotic antidepressants may be more useful in treating sleep disturbances in PTSD.[5]

Antipsychotic agents may be useful in the short term for acute agitation, but, in general, experience with these drugs is limited to use as an adjunct to SSRIs in chronic PTSD, mainly if patients exhibit psychotic-like symptoms, bipolar features, lack of impulse control, and aggression, or if there has been lack of response to other treatments.

CHALLENGES FOR PHARMACOLOGIC TREATMENT OF PTSD

Effective pharmacotherapy of PTSD may be complicated by a number of cultural and social factors. It cannot be assumed that treatments are universally accepted in all cultures, and one needs to consider different beliefs, concerns, and taboos surrounding illness and treatment in different settings, and the varying degree to which family members become involved, for example. Skepticism toward medication on the part of patients needs to be addressed by providing more education, increasing patient contact, and offering assistance with problems. Failure to do so may result in high rates of attrition or treatment nonadherence.

A shortage of trained professionals and a lack of resources can also pose challenges, particularly after a major disaster such as the 2004 Asian tsunami. Worldwide, much of the burden of diagnosis and prescription of psychotropic medications falls on the family doctor, and it is therefore necessary to optimize the management of PTSD in the primary care setting.

Ethnic differences in drug metabolism require attention to dosing issues and side effects when treating trauma. In some Asian populations, for example, higher plasma drug levels occur with tricyclic antidepressants, lithium, and haloperidol, leading to a greater incidence of side effects.[48]

There is currently a lack of studies assessing the efficacy and safety of pharmacotherapy in children with PTSD. SSRIs are effective in other anxiety disorders such as obsessive-compulsive disorder, social phobia, and generalized anxiety disorder in children, and although these findings may be reasonably extrapolated to PTSD for the purposes of routine clinical practice, PTSD-specific trials are needed. It is also unclear for how long children should receive medication. If the response is good after 9 months, discontinuation may be considered, although this should depend on the stability of the individual's life and circumstances.

ALGORITHM FOR PHARMACOTHERAPY OF PTSD

The International Psychopharmacology Algorithm Project (accessible at http://www.ipap.org) has completed the development of psychopharmacology algorithms for the management of PTSD. These algorithms, which are reflections of consensus opinions from experts throughout the world, are intended to provide helpful guidance for all professionals engaged in the treatment of PTSD, particularly with respect to clinical decision making during the various stages of the management of PTSD.

SUMMARY

SSRIs and SNRIs are recommended as first-line therapy for PTSD. They are effective across all symptom clusters, demonstrate no firmly established gender differences in efficacy, and appear to be useful in treating PTSD following all types of trauma. They are also effective in treating PTSD with comorbid disorders, such as depression and anxiety disorders. While further information is required on the role of SSRIs and SNRIs in the treatment of survivors of mass trauma and disaster, many people believe that effective pharmacotherapy of PTSD in survivors of the 2004 Asian tsunami can contribute in important ways toward both the recovery process for individuals and public health and economic recovery in the region.

Drug names: bupropion (Wellbutrin and others), carbamazepine (Tegretol and others), divalproex sodium (Depakote), fluoxetine (Prozac and others), imipramine (Tofranil and others), lamotrigine (Lamictal), mirtazapine (Remeron), olanzapine (Zyprexa), paroxetine (Paxil, Pexeva, and others), prazosin (Minipress and others), propranolol (Inderal and others), risperidone (Risperdal), sertraline (Zoloft), topiramate (Topamax), venlafaxine (Effexor).

Disclosure of off-label usage: The author has determined that, to the best of his knowledge, bupropion, carbamazepine, divalproex sodium, fluoxetine, imipramine, lamotrigine, mirtazapine, nefazodone, olanzapine, prazosin, propranolol, risperidone, topiramate, and venlafaxine are not approved by the U.S. Food and Drug Administration for the treatment of posttraumatic stress disorder.

REFERENCES

1. Davidson JRT, Book SW, Colket JT, et al. Assessment of a new self-rating scale for post-traumatic stress disorder. Psychol Med 1997;27:153–160
2. Weathers FW, Keane TM, Davidson JR. Clinician-Administered PTSD Scale: a review of the first ten years of research. Depress Anxiety 2001; 13:132–156
3. Connor KM, Davidson JR. SPRINT: a brief global assessment of post-traumatic stress disorder. Int Clin Psychopharmacol 2001;16:279–284
4. Davidson JR, Colket JT. The eight-item treatment-outcome post-traumatic stress disorder scale: a brief measure to assess treatment outcome in post-traumatic stress disorder. Int Clin Psychopharmacol 1997; 12:41–45
5. Ballenger JC, Davidson JR, Lecrubier Y, et al. Consensus statement on posttraumatic stress disorder from the International Consensus Group on Depression and Anxiety. J Clin Psychiatry 2000;61(suppl 5):60–66
6. Meltzer-Brody S, Connor KM, Churchill E, et al. Symptom-specific effects of fluoxetine in post-traumatic stress disorder. Int Clin Psychopharmacol 2000;15:227–231
7. Davidson JR, Payne VM, Connor KM, et al. Trauma, resilience and saliostasis: effects of treatment in post-traumatic stress disorder. Int Clin Psychopharmacol 2005;20:43–48
8. Van der Kolk BA, Dreyfuss D, Michaels M, et al. Fluoxetine in posttraumatic stress disorder. J Clin Psychiatry 1994;55:517–522
9. Connor KM, Sutherland SM, Tupler LA, et al. Fluoxetine in post-traumatic stress disorder: randomised, double-blind study. Br J Psychiatry 1999;175:17–22
10. Martenyi F, Brown EB, Zhang H, et al. Fluoxetine versus placebo in posttraumatic stress disorder. J Clin Psychiatry 2002;63:199–206
11. Tucker P, Zaninelli R, Yehuda R, et al. Paroxetine in the treatment of chronic posttraumatic stress disorder: results of a placebo-controlled, flexible-dosage trial. J Clin Psychiatry 2001;62:860–868
12. Marshall RD, Beebe KL, Oldham M, et al. Efficacy and safety of paroxetine treatment for chronic PTSD: a fixed-dose, placebo-controlled study. Am J Psychiatry 2001;158:1982–1988
13. Stein DJ, Davidson J, Seedat S, et al. Paroxetine in the treatment of post-traumatic stress disorder: pooled analysis of placebo-controlled studies. Expert Opin Pharmacother 2003;4:1829–1838
14. Brady K, Pearlstein T, Asnis GM, et al. Efficacy and safety of sertraline treatment of posttraumatic stress disorder: a randomized controlled trial. JAMA 2000;283:1837–1844
15. Davidson JR, Rothbaum BO, van der Kolk BA, et al. Multicenter, double-blind comparison of sertraline and placebo in the treatment of posttraumatic stress disorder. Arch Gen Psychiatry 2001;58:485–492
16. Davidson JRT, Baldwin DS, Stein DJ, et al. A 24 week, placebo-controlled study of venlafaxine XR in the treatment of posttraumatic stress disorder [poster]. Presented at the 45th annual meeting of the New Clinical Drug Evaluation Unit; June 6–9, 2005; Boca Raton, Fla
17. Davidson JR, Landerman LR, Farfel GM, et al. Characterizing the effects of sertraline in post-traumatic stress disorder. Psychol Med 2002;32:661–670
18. Londborg PD, Hegel MT, Goldstein S, et al. Sertraline treatment of post-traumatic stress disorder: results of 24 weeks of open-label continuation treatment. J Clin Psychiatry 2001;62:325–331
19. Davidson JR, Weisler RH, Butterfield MI, et al. Mirtazapine vs placebo in posttraumatic stress disorder: a pilot trial. Biol Psychiatry 2003;53: 188–191
20. Davidson JRT, Lipschitz A, Musgnung J. Treatment of PTSD with venlafaxine XR, sertraline, or placebo: a double-blind comparison [abstract].

Int J Neuropsychopharmacol 2004;7(suppl 1):S364–S365
21. Hertzberg MA, Butterfield MI, Feldman ME, et al. A preliminary study of lamotrigine for the treatment of posttraumatic stress disorder. Biol Psychiatry 1999;45:1226–1229
22. Tucker P. Efficacy and safety of topiramate in the treatment of civilian posttraumatic stress disorder: a randomized, double-blind, placebo-controlled study [poster]. Presented at the 25th annual conference of the Anxiety Disorders Association of America; March 19, 2005; Seattle, Wash
23. Davis LL, Jewell ME, Ambrose S, et al. A placebo-controlled study of nefazodone for the treatment of chronic posttraumatic stress disorder: a preliminary study. J Clin Psychopharmacol 2004;24:291–297
24. Davis LL, Nevels S, Nevels C, et al. Wellbutrin for the treatment of posttraumatic stress disorder. Presented at the 15th annual meeting of the International Society for Traumatic Stress Studies; November 1999; Miami, Fla
25. Stein MB, Kline NA, Matloff JL. Adjunctive olanzapine for SSRI-resistant combat-related PTSD: a double-blind, placebo-controlled study. Am J Psychiatry 2002;159:1777–1779
26. Bartzokis G, Lu PH, Turner J, et al. Adjunctive risperidone in the treatment of chronic combat-related posttraumatic stress disorder. Biol Psychiatry 2005;57:474–479
27. Hamner MB, Faldowski RA, Ulmer HG, et al. Adjunctive risperidone treatment in post-traumatic stress disorder: a preliminary controlled trial of effects on comorbid psychotic symptoms. Int Clin Psychopharmacol 2003;18:1–8
28. Atypical antipsychotics. British National Formulary. 49th ed. London, England: Pharmaceutical Press; 2005. Available at: http://www.bnf.org/bnf/bnf/current/doc/65561.htm. Accessed June 10, 2005
29. Raskind MA, Peskind ER, Kanter ED, et al. Reduction of nightmares and other PTSD symptoms in combat veterans by prazosin: a placebo-controlled study. Am J Psychiatry 2003;160:371–373
30. Taylor F, Raskind MA. The alpha-1 adrenergic antagonist prazosin improves sleep and nightmares in civilian trauma posttraumatic stress disorder. J Clin Psychopharmacol 2002;22:82–85
31. Rothbaum BO, Foa EB, Davidson JRT, et al. Augmentation of sertraline with prolonged exposure in PTSD [poster]. Presented at the 159th annual meeting of the American Psychiatric Association; May 1–5, 2004; New York, NY
32. Davidson JR. Remission in post-traumatic stress disorder (PTSD): effects of sertraline as assessed by the Davidson Trauma Scale, Clinical Global Impressions and the Clinician-Administered PTSD scale. Int Clin Psychopharmacol 2004;19:85–87
33. Masand PS. Tolerability and adherence issues in antidepressant therapy. Clin Ther 2003;25:2289–2304
34. Ballenger JC. Remission rates in patients with anxiety disorders treated with paroxetine. J Clin Psychiatry 2004;65:1696–1707
35. Ouimette P, Moos RH, Finney JW. PTSD treatment and 5-year remission rates among patients with substance use and posttraumatic stress disorders. J Consult Clin Psychol 2003;71:410–414
36. Davidson JR, Connor KM, Hertzberg MA, et al. Maintenance therapy with fluoxetine in posttraumatic stress disorder: a placebo-controlled discontinuation study. J Clin Psychopharmacol 2005;25:166–169
37. Davidson J, Pearlstein T, Londborg P, et al. Efficacy of sertraline in preventing relapse of posttraumatic stress disorder: results of a 28-week double-blind, placebo-controlled study. Am J Psychiatry 2001;158:1974–1981
38. Martenyi F, Brown EB, Zhang H, et al. Fluoxetine versus placebo in prevention of relapse in post-traumatic stress disorder. Br J Psychiatry 2002;181:315–320
39. Kessler RC, Sonnega A, Bromet E, et al. Post-traumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 1995;52:1048–1060
40. Brady KT, Clary CM. Affective and anxiety comorbidity in post-traumatic stress disorder treatment trials of sertraline. Compr Psychiatry 2003;44:360–369
41. Brady KT, Sonne SC, Roberts JM. Sertraline treatment of comorbid posttraumatic stress disorder and alcohol dependence. J Clin Psychiatry 1995;56:502–505
42. Brady KT, Sonne S, Anton RF, et al. Sertraline in the treatment of co-occurring alcohol dependence and posttraumatic stress disorder. Alcohol Clin Exp Res 2005;29:395–401
43. Robert R, Blakeney PE, Villarreal C, et al. Imipramine treatment in pediatric burn patients with symptoms of acute stress disorder: a pilot study. J Am Acad Child Adolesc Psychiatry 1999;38:873–882
44. Pitman RK, Sanders KM, Zusman RM, et al. Pilot study of secondary prevention of posttraumatic stress disorder with propranolol. Biol Psychiatry 2002;51:189–192
45. Vaiva G, Ducrocq F, Jezequel K, et al. Immediate treatment with propranolol decreases posttraumatic stress disorder two months after trauma. Biol Psychiatry 2003;54:947–949
46. Gelpin E, Bonne O, Peri T, et al. Treatment of recent trauma survivors with benzodiazepines: a prospective study. J Clin Psychiatry 1996;57:390–394
47. Mellman TA, Bustamante V, David D, et al. Hypnotic medication in the aftermath of trauma. J Clin Psychiatry 2002;63:1183–1184
48. Lin K-M. Biological differences in depression and anxiety across races and ethnic groups. J Clin Psychiatry 2001;62(suppl 13):13–19

Psychosocial Therapy for Posttraumatic Stress Disorder

Edna B. Foa, Ph.D.

Immediately after experiencing a traumatic event, many people have symptoms of posttraumatic stress disorder (PTSD). If trauma victims restrict their routine and systematically avoid reminders of the incident, symptoms of PTSD are more likely to become chronic. Several clinical studies have shown that programs of cognitive-behavioral therapy (CBT) can be effective in the management of patients with PTSD. Prolonged exposure (PE) therapy—a specific form of exposure therapy—can provide benefits, as can stress inoculation training (SIT) and cognitive therapy (CT). PE is not enhanced by the addition of SIT or CT. PE therapy is a safe treatment that is accepted by patients, and benefits remain apparent after treatment programs have finished. Nonspecialists can be taught to practice effective CBT. For the treatment of large numbers of patients, or for use in centers where CBT has not been routinely employed previously, appropriate training of mental health professionals should be performed. Methods used for the dissemination of CBT to nonspecialists need to be modified to meet the requirements of countries affected by the Asian tsunami. This will entail the use of culturally sensitive materials and the adaptation of training methods to enable large numbers of mental health professionals to be trained together. *(J Clin Psychiatry 2006;67[suppl 2]:40–45)*

DEVELOPMENT OF POSTTRAUMATIC STRESS DISORDER

Following exposure to a traumatic event, some people come to view the world as dangerous and believe that they are unable to cope with life. If trauma survivors restrict their daily routine and systematically avoid reminders of the incident—including thinking and talking about the event—these beliefs may be maintained and the symptoms of posttraumatic stress disorder (PTSD) become chronic.[1]

Posttraumatic stress disorder may be underpinned by dysfunctional cognition involving negative thoughts about the world (perceiving people to be untrustworthy and no place to be safe), negative thoughts about self (feelings of incompetence and considering PTSD symptoms to be a sign of weakness), and self-blame (guilt and believing that other people would have prevented the trauma).

From the Center for the Treatment and Study of Anxiety, University of Pennsylvania, Philadelphia.

Presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and supported by an educational grant from Pfizer Inc.

Corresponding author and reprints: Edna B. Foa, Ph.D., Center for the Treatment and Study of Anxiety, University of Pennsylvania, 3535 Market St., 6th Floor, Philadelphia, PA 19104 (e-mail: foa@mail.med.upenn.edu).

TREATMENT OF PTSD

Cognitive-behavioral therapy (CBT) can be used to treat patients with chronic PTSD.[2] Indeed, there is compelling and consistent evidence demonstrating the efficacy of CBT for the treatment of PTSD.[3] By safely confronting reminders of the trauma—with exposure to memories and situations or discussion of the thoughts and beliefs associated with the trauma—the dysfunctional cognition underlying PTSD is modified. A variety of cognitive-behavioral treatments is available[3]; exposure therapy, anxiety management, or cognitive therapy can be used.

Exposure therapy is a set of techniques, such as systematic desensitization and flooding, that help patients to confront their feared objects, situations, memories, or images in safe circumstances. Patients subsequently recognize that their fears are unrealistic. In programs of anxiety management, by using methods such as relaxation training, controlled breathing, positive self-talk and imagery, social skills training, and distraction techniques (such as thought stopping), patients are helped to manage their anxiety. Stress inoculation training (SIT)[4] is a form of anxiety management. Cognitive therapy (CT) aims to help patients change negative, unrealistic cognitions by identifying dysfunctional thoughts and beliefs, challenging these ideas, and replacing them with functional, realistic cognitions.

This article considers how techniques of CBT may be used alone, or in combination, to provide support for patients with PTSD. Particular emphasis is given to prolonged exposure (PE) therapy. This is a specific exposure

therapy program that has been developed and evaluated for the treatment of PTSD.[5–7]

PROLONGED EXPOSURE THERAPY

Therapeutic Programs

In PE therapy, patients attend a series of sessions with a therapist. During these sessions, patients undergo breathing retraining, education about common reactions to trauma, and imaginal exposure to the trauma memory. Between the sessions, in vivo exposure to reminders of trauma is encouraged, together with listening to a tape recording in which the patient describes his/her traumatic event.

Imaginal exposure involves patients recounting traumatic events. By repeatedly doing this, patients eventually organize their memories coherently rather than merely remembering fragments of the situation. Patients may then start to put the event into the past. Negative feelings, such as guilt or shame, that may be associated with the trauma, subsequently diminish when the patient gains new perspective through repeatedly narrating the traumatic event.

In vivo exposure involves patients encountering safe trauma-related situations and objects. Initially, less fearful situations are dealt with; patients subsequently move on to more fearful encounters when they are ready to do so. This helps patients to learn that their avoidance behavior is unnecessary, and they rebuild routine into their daily lives. They may, for instance, initially go to the corner store with their spouse and then gradually progress to going alone into crowded places such as shopping malls.

Program Format

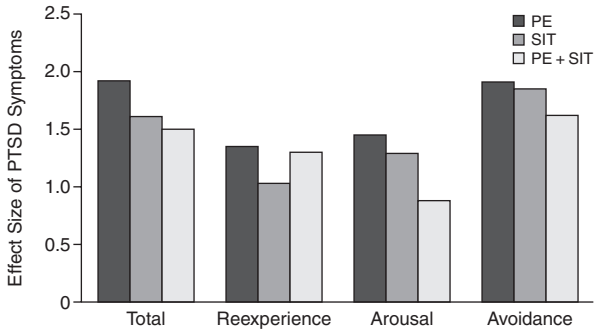
Programs of PE therapy follow a structured format. In the first session, the program is described to the patient, trauma history is discussed, and breathing retraining is introduced. The second session involves a discussion of common reactions to trauma; the rationale for in vivo exposure is introduced, a list of situations avoided by the patient is compiled, and in vivo exposure exercises are assigned. Subsequent sessions introduce the rationale for imaginal exposure, guide the patient through this, and discuss thoughts and feelings related to the traumatic memory. Further in vivo and imaginal exposure exercises are also assigned.

Patients generally receive around 10 to 15 sessions in a program, with the final session further guiding the imaginal exposure, discussing the benefit that has been received from the therapy, and considering the need for any additional treatment relating to other issues.

Effects of PE Therapy

Several clinical studies have analyzed the effects of PE therapy, both alone and in combination with other treatments, for the management of a variety of patients with PTSD.

Figure 1. Posttreatment Effect Sizes[a] of Prolonged Exposure (PE), Stress Inoculation Training (SIT), and PE and SIT Combined in Patients With PTSD[b]

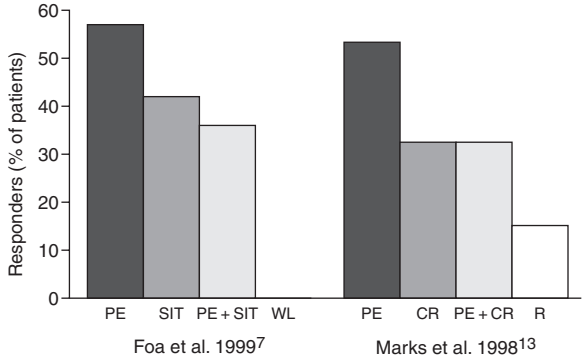


[a]Effect size compared to wait-list group at posttreatment.
[b]Data from Foa et al.[7] and E.B.F., unpublished data, September 1992.
Abbreviation: PTSD = posttraumatic stress disorder.

Foa et al.[7] described a study of 96 female assault victims with a primary diagnosis of chronic PTSD (DSM-III-R criteria[8]). According to these criteria, PTSD symptoms are divided into 3 classes: reexperiencing the trauma, increased emotional arousal, and avoidance of trauma-related stimuli. For a diagnosis of PTSD, patients should have at least 1 symptom of reexperience, 2 symptoms of increased emotional arousal, and 3 symptoms of avoidance. The symptoms should persist for at least 1 month. The women in the study were randomly assigned to be wait-list controls (N = 15) or to receive active treatment with PE (N = 25), SIT (based on a program adapted from Veronen and Kilpatrick,[9] but omitting explicit instructions for in vivo homework; N = 26), or combined treatment (SIT + PE; N = 30). Active treatment comprised 9 twice-weekly individual sessions. Outcome measures included the PTSD Symptom Scale (PSS-I),[10] the Beck Depression Inventory[11] and the State-Trait Anxiety Inventory.[12] The diagnostic status of the patients after treatment was also used as a measure of end-state functioning. It was found that all 3 active treatments reduced the percentage of patients with PTSD compared with wait-list controls.[7]

Another way to assess how well a treatment works is to calculate the degree of symptom reduction occurring from pretreatment to posttreatment (within session effect size) or to calculate the difference between the posttreatment mean symptoms of the treatment of interest (e.g., PE) and the mean of a control group (e.g., wait-list). This calculation produces a posttreatment effect size that indicates how effective the active treatment is compared with nontreatment or a weaker treatment. Posttreatment effect sizes demonstrated that the benefit of treatment with PE therapy alone was greater compared with the other treatment regimens (Figure 1).[7] However, combining PE

Figure 2. Posttreatment End-State Functioning of Patients With PTSD Who Received Prolonged Exposure (PE), Stress Inoculation Training (SIT), Cognitive Restructuring (CR), Relaxation Training (R), or a Combination of These[a]



[a]Data from Foa et al.[7] and Marks et al.[13] Results for wait-list patients (WL; 0%) are also shown.
Abbreviation: PTSD = posttraumatic stress disorder.

therapy with other treatments did not produce any additional benefit. The positive effects of therapy remained apparent at follow-up.

In a study of patients with PTSD resulting from a variety of different traumas,[13] the effects of treatment with PE, cognitive restructuring (CR), CR + PE, or relaxation training were compared. Eighty-seven patients who had been experiencing PTSD (DSM-III-R criteria[8]) for at least 6 months were randomly assigned to receive 10 sessions of exposure therapy (N = 23), CR (based on a program described by Thrasher et al.[14]; N = 19), CR + exposure therapy (N = 24), or relaxation training (N = 21). The treatment program differs from PE in that the first session is devoted to imaginal exposure and the last 5 sessions to in vivo exposure; in PE, imaginal and in vivo exposure are conducted concurrently. The sessions generally took place on a weekly basis. PTSD was assessed using the Clinician-Administered PTSD Scale (CAPS 2),[15] together with the Impact of Event Scale[16] and the self-rated PSS-I. Other self-rated measures used to assess patients' psychological well-being included the Beck Depression Inventory and the State-Trait Anxiety Inventory. The authors reported that PE and CR were both effective when used alone, improving PTSD markedly on a broad front. Both treatments were superior to relaxation training, but they were not mutually enhancing when combined.[13]

In the above studies,[7,13] more patients treated with PE showed good end-state functioning than those who were treated with SIT or CR alone or in combination with exposure therapy (Figure 2). Foa et al.[17] have subsequently described another study that showed similar results. The effects of treating female assault victims with PE alone or PE in combination with CR were analyzed, and both active treatments provided benefit compared to wait-list controls. There was, however, no advantage accrued from providing patients with the more complex treatment regimen. Benefits from treatment remained unchanged at the end of the follow-up period.

Refugees with PTSD have been treated with PE or PE + CR.[18] Sixteen outpatients who fulfilled DSM-IV criteria[19] for PTSD were randomly assigned to receive treatment on an individual basis for 16 to 20 weekly sessions. Patients' PTSD symptoms were assessed with the Clinician-Administered PTSD Scale for DSM-IV[20] together with the self-administered version of the PSS-I and the Impact of Event Scale, Revised.[21] Patients were assessed before and after treatment and at a 6-month follow-up. Large improvements in the symptoms of PTSD were apparent after therapy, and improvements were still evident at the 6-month follow-up. There was no difference between the 2 treatment regimens.

Eye movement desensitization and reprocessing (EMDR) has also been used for the treatment of patients with PTSD.[22] A controlled clinical study has shown PE + SIT to be clinically more effective than EMDR in reducing pathology related to PTSD.[23] The superiority was more evident after a 3-month follow-up period. Rothbaum et al.[24] compared EMDR with PE and wait-list patients whose treatment was delayed for 10 weeks. Both active treatments produced similar improvement in PTSD, depression, and anxiety at a posttreatment assessment, but at a 6-month follow-up, PE was found to be superior to EMDR on several measures.

The results of studies such as those described above[7,13,17,18,23] show that programs of CBT can be effective in the management of patients with PTSD. PE therapy, SIT, and CT can all provide benefits to PTSD patients. Therapy that includes both in vivo and imaginal exposure produces excellent outcomes. However, PE therapy is not enhanced by the addition of SIT or CT. PE is a safe treatment that is accepted by patients, and its benefits remain apparent after programs of therapy have finished.

TRAINING IN THE USE OF CBT

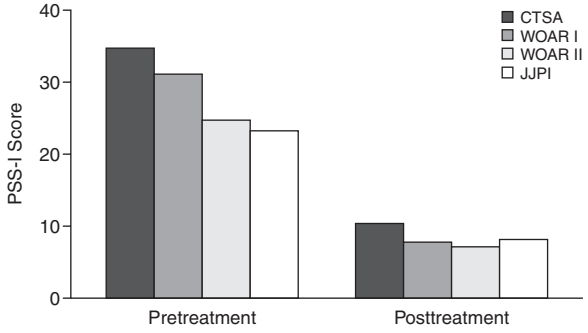
Training Nonspecialists to Use CBT

Nonspecialists can be taught to practice effective CBT. For the treatment of large numbers of patients, or for use in centers where CBT has not been routinely employed previously, appropriate training of mental health professionals should be performed.

After a car bomb exploded in Omagh, Northern Ireland, in 1998, killing 29 people and 2 unborn twins and injuring over 370 other people, National Health Service Staff with modest prior training in CBT received brief training for specialist procedures in PTSD.[25] Ninety-one patients with PTSD (DSM-IV criteria[19]) were subsequently treated with CT, based on a model proposed by

Ehlers and Clark.[26] There were no major exclusion criteria, and patients with comorbidities were included. Patients received a median of 8 sessions of treatment. After therapy, patients showed improvements with regard to PTSD severity, as measured using the Posttraumatic Diagnostic Scale.[27] The authors stated that the degree of improvement observed was comparable to that from a randomized controlled trial, which has recently been reported by Ehlers et al.[28] Consequently, it was concluded that the positive findings obtained in research settings could be obtained in a frontline, nonselective service.

Figure 3. Effects of PE Treatment on PTSD Assessed Using the PSS-I by Recently Trained Community Counselors Treating Assault Victims in Philadelphia, Pa.[a,b]



[a]Data from Foa et al.[17] and E. A. Hembree, Ph.D.; E.B.F., unpublished data, September 2001. Results for newly trained counselors at 2 centers (WOAR and JJPI) are compared with results obtained by experienced therapists at the CTSA.
[b]The WOAR I and JJPI results were obtained with the newly trained therapists receiving weekly supervision from a CTSA expert. The WOAR II results show the effects of withdrawing this weekly supervision.
Abbreviations: CTSA = Center for the Treatment and Study of Anxiety, JJPI = Joseph J. Peters Institute, PE = prolonged exposure, PSS-I = PTSD Symptom Scale Interview, PTSD = posttraumatic stress disorder, WOAR = Women Organized Against Rape.

Models for the Dissemination of PE Programs

Two models for the dissemination of PE programs have been advanced.[29] In the first of these, therapists who will be administering the treatment receive intensive training followed by direct, ongoing supervision from experts in PE therapy.

This method of training has been assessed in a 6-year study, involving community therapists working with patients from a community rape center in Philadelphia, Pa.: Women Organized Against Rape (WOAR).[17] Prior to the training that was given using the model, these clinics had been providing supportive counseling intended to help recovery from sexual assault. Group therapy aimed to promote recovery through social support and normalization of the reactions to assault. Exercises designed to heal and empower the victims were also being performed.

For dissemination of the PE program, the therapists received initial training given by experts from the Center for the Treatment and Study of Anxiety (CTSA), Philadelphia, Pa., in the form of a 5-day intensive workshop. In a second week of intensive training, the community therapists were taught about CR. The counselors also learned about assessment tools used to measure PTSD, as use of these would enable an evaluation of treatment efficacy to be performed. Each therapist then received supervision from a CTSA expert while completing at least 2 training cases. The therapists subsequently treated patients with PTSD (adult female rape victims and victims of child sexual abuse). Patients received 9 to 12 sessions of PE alone, received PE + CR, or were assigned to a wait list before being given 1 of the 2 active treatments. Throughout the course of the study, the therapists received weekly supervision from a CTSA expert. In addition, 2-day "booster workshops" were held every 6 months for the first 2 years.

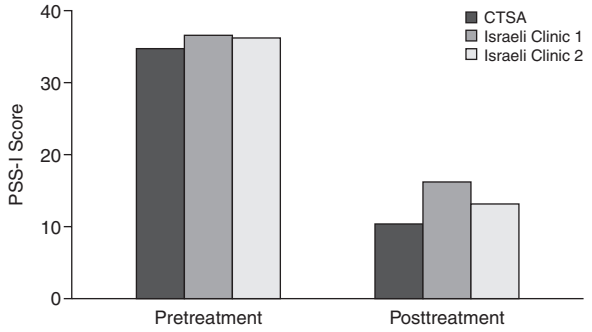
In parallel, a similar cohort of patients received treatment from CTSA therapists with expertise in the use of CBT for PTSD.[17] In these patients, it was found that both PE and PE + CR were very effective in reducing the symptoms of PTSD compared with wait-list controls. PE + CR did not produce better results than PE alone.[17] A comparison of the patients receiving therapy at the CTSA with those being treated by the community-based therapists showed no difference in treatment outcome between the 2 sites, thereby demonstrating the effectiveness of the dissemination model.

Two additional, and related, dissemination studies are currently being performed (E. A. Hembree, Ph.D.; E.B.F., unpublished data, September 2001 [both studies]). One of these, which is attempting to repeat the success of the initial 6-year study, involves the Joseph J. Peters Institute. This is another center in Philadelphia that provides outpatient treatment for victims of sexual abuse. Members of staff at the institute are receiving similar basic training and intensive supervision to that previously given to the WOAR counselors. In the other study, the weekly supervision of the WOAR therapists by CTSA experts has been withdrawn and replaced by supervision from a WOAR senior clinical staff member. It has been found that the WOAR counselors are still able to provide beneficial therapy. Results from these studies are summarized in Figure 3.

Although these results illustrate that it is possible to disseminate PE programs, the method described above is both labor-intensive and costly, requiring experts to be on-site. Consequently, such training may be limited to regions where experts are readily available.

An alternative model for disseminating PE programs has also been developed.[29] This aims to reduce the involvement of experts and is therefore less expensive. It can also enable training to take place in regions of the world that did not previously have access to local expertise in PE therapy. Community clinicians travel to expert clinics to learn how to use CBT treatments. They subsequently return to their

Figure 4. Effects of PE Treatment on PTSD Assessed Using the PSS-I by Recently Trained Therapists Treating Combat Veterans or Attack Victims in Israel[a]



[a]Data from Foa et al.[17] and N. Nacasch, M.D.; E.B.F.; L. Fostick, M.A.; et al., unpublished data, June 2002. Results from newly trained therapists in 2 clinics in Israel are compared with results obtained by CTSA experts.

Abbreviations: CTSA = Center for the Treatment and Study of Anxiety, PE = prolonged exposure, PSS-I = PTSD Symptom Scale Interview, PTSD = posttraumatic stress disorder.

communities to train and supervise local health professionals in the delivery of these techniques. Although experience with this second model is currently more limited than with the first method of dissemination, initial evidence suggests that it can be successful. Community supervisors from Israel given 2 weeks of training at an expert clinic have subsequently assisted CBT experts in training community therapists in Israel (N. Nacasch, M.D.; E.B.F.; L. Fostick, M.A.; et al., unpublished data, June 2002). The newly trained therapists then treated PTSD patients (combat veterans or victims of attacks) while receiving guidance from the community supervisors. Results from 2 clinics have confirmed that patients treated by the newly trained therapists have received effective therapy for treatment of both PTSD (Figure 4) and depression. Such results validate the efficacy of this training model and illustrate that training over long distances can be successfully accomplished. By creating a local culture of expertise, patients with PTSD can be treated with PE programs without the extensive involvement of outside experts.

The models described above demonstrate that clinicians who are not experts in CBT can, within a short period of time, be taught to successfully implement programs of PE. Furthermore, clinicians can be trained to pass on these techniques such that the consequent reduction of expert involvement in supervision and/or training does not decrease treatment efficacy.

CHALLENGES FACED AFTER THE ASIAN TSUNAMI

Studies have shown CBT, particularly PE, to be effective for the treatment of PTSD.[7,13,17,18,23] The use of CBT may therefore prove valuable in treating patients who have PTSD as a consequence of the Asian tsunami. In this respect, treatment should be directed appropriately, being given to people who do not recover from the trauma of the event on their own. One to 2 weeks should elapse before therapy is commenced, so that patients are given time to have some stabilization of their environment before they receive treatment. If after 2 weeks the symptoms are still quite severe and there is no evidence of symptom reduction and/or there is an increase in symptom severity, treatment should be offered to the person.

Through the implementation of successful dissemination methods, techniques of CBT suitable for the treatment of PTSD can be successfully adopted by nonexperts.[26] Of interest, PE has been successfully delivered not only in western countries, such as the United States and Israel, but also to patients in both Japan and Korea without medication after their therapists participated in a 4-day training session in the United States and Israel. However, the therapists in both countries were psychiatrists, psychologists, and social workers who are familiar with Western psychology and psychiatry, and several have studied in the United States. Additionally, most of the patients were educated and belonged to the middle class. However, given the huge number of individuals affected by the Asian tsunami, treatment will have to be delivered not only by mental health professionals but also by community leaders, such as teachers, who will need to be trained by them. Also, the patients are likely to have different educational levels and diverse cultural backgrounds. Thus, the methods that have been used in the United States and Israel, and even in Japan and Korea, may need to be modified to meet the requirements of countries affected by the Asian tsunami. This will entail the use of culturally sensitive materials and the adaptation of training methods to enable large numbers of mental health professionals to be trained together and to enable the training of paraprofessionals.

Disclosure of off-label usage: The author has determined that, to the best of her knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling has been presented in this article.

REFERENCES

1. Foa EB, Cahill SP. Psychological therapies: emotional processing. In: Smelser NJ, Bates PB, eds. International Encyclopedia of the Social and Behavioral Sciences. Oxford, England: Elsevier; 2001:12363–12369
2. Foa EB, Meadows EA. Psychosocial treatments for posttraumatic stress disorder: a critical review. In: Spence J, Darley JM, Foss DJ, eds. Annual Review of Psychology, vol 48. Palo Alto, Calif: Annual Reviews; 1997: 449–480
3. Foa EB, Keane T, Friedman MJ. Effective Treatments for PTSD. New York, NY: Guilford Press; 2000
4. Meichenbaum D. Cognitive-Behavior Modification. Morristown, NJ: General Learning Press; 1974
5. Foa EB, Rothbaum BO, Riggs DS, et al. Treatment of posttraumatic stress disorder in rape victims: a comparison between cognitive-

behavioral procedures and counseling. J Consult Clin Psychol 1991;59:715–723
6. Foa EB, Rothbaum BO. Treating the Trauma of Rape: Cognitive-Behavioral Therapy for PTSD. New York, NY: Guilford Press; 1998
7. Foa EB, Dancu CV, Hembree EA, et al. A comparison of exposure therapy, stress inoculation training, and their combination for reducing posttraumatic stress disorder in female assault victims. J Consult Clin Psychol 1999;67:194–200
8. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised. Washington, DC: American Psychiatric Association; 1987
9. Veronen LJ, Kilpatrick DG. Stress management for rape victims. In: Meichenbaum D, Jaremko ME, eds. Stress Reduction and Prevention. New York, NY: Plenum; 1983:341–374
10. Foa EB, Riggs DS, Dancu CV, et al. Reliability and validity of a brief instrument for assessing posttraumatic stress disorder. J Trauma Stress 1993;6:459–473
11. Beck AT, Ward CH, Mendelsohn M, et al. An inventory for measuring depression. Arch Gen Psychiatry 1961;4:561–571
12. Spielberger CD. Manual for the State-Trait Anxiety Inventory (Form Y) (Self-Evaluation Questionnaire). Palo Alto, Calif: Consulting Psychologists Press; 1983
13. Marks I, Lovell K, Noshirvani H, et al. Treatment of posttraumatic stress disorder by exposure and/or cognitive restructuring: a controlled study. Arch Gen Psychiatry 1998;55:317–325
14. Thrasher SM, Lovell K, Noshirvani H, et al. Cognitive restructuring in the treatment of posttraumatic stress disorder: 2 single cases. Clin Psychol Psychother 1996;3:137–148
15. Blake DB, Weathers FW, Nagy LM, et al. The development of a clinician-based PTSD Scale. J Trauma Stress 1995;8:75–90
16. Horowitz MJ, Wilner N, Alvarez W. Impact of Event Scale: a measure of subjective stress. Psychosom Med 1979;41:209–218
17. Foa EB, Hembree EA, Cahill SP, et al. Randomized trial of prolonged exposure for PTSD with and without cognitive restructuring: outcome at academic and community clinics. J Consult Clin Psychol. In press
18. Paunovic N, Öst LG. Cognitive-behavior therapy vs exposure therapy in the treatment of PTSD in refugees. Behav Res Ther 2001;39:1183–1197
19. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington, DC: American Psychiatric Association; 1994
20. Blake DD, Weathers FW, Nagy LM, et al. Clinician Administered PTSD Scale for DSM-IV. National Center for PTSD, Behavioral Science Division, Boston VA Medical Center, Mass, and Neurosciences Division at West Haven VA Medical Center, Conn; 1997
21. Weiss DS, Marmar CR. The Impact of Event Scale, Revised. In: Wilson JP, Keane TM, eds. Assessing Psychological Trauma and PTSD. New York, NY: Guilford Press; 1997:399–411
22. Shapiro F. Eye movement desensitization: a new treatment for posttraumatic stress disorder. J Behav Ther Exp Psychiatry 1989;20:211–217
23. Devilly GJ, Spence SH. The relative efficacy and treatment distress of EMDR and a cognitive-behavior trauma treatment protocol in the amelioration of posttraumatic stress disorder. J Anxiety Disord 1999;13:131–157
24. Rothbaum BO, Astin MC, Marsteller F. Prolonged exposure vs EMDR for PTSD rape victims. J Trauma Stress. In press
25. Gillespie K, Duffy M, Hackmann A, et al. Community based cognitive therapy in the treatment of posttraumatic stress disorder following the Omagh bomb. Behav Res Ther 2002;40:345–357
26. Ehlers A, Clark DM. A cognitive model of posttraumatic stress disorder. Behav Res Ther 2000;38:319–345
27. Foa EB, Cashman L, Jaycox L, et al. The validation of a self-report measure of posttraumatic stress disorder: the Posttraumatic Diagnostic Scale. Psychol Assess 1997;9:445–451
28. Ehlers A, Clark DM, Hackman A, et al. Cognitive therapy for posttraumatic stress disorder: development and evaluation. Behav Res Ther 2005;43:413–431
29. Cahill SP, Hembree EA, Foa EB. Dissemination of prolonged exposure therapy for posttraumatic stress disorder: success and challenges. In: Neria Y, Gross R, Marshall R, et al, eds. 9/11: Public Health in the Wake of Terrorist Attacks. Cambridge, England: Cambridge University Press. In press

Assessment of Resilience in the Aftermath of Trauma

Kathryn M. Connor, M.D.

Resilience is a crucial component in determining the way in which individuals react to and deal with stress. A broad range of features is associated with resilience; these features relate to the strengths and positive aspects of an individual's mental state. In patients with posttraumatic stress disorder, resilience can be used as a measure of treatment outcome, with improved resilience increasing the likelihood of a favorable outcome. Resilience can be monitored using the Connor-Davidson Resilience Scale, and perceived vulnerability to the effects of stress can be monitored with the Sheehan Stress Vulnerability Scale. Both scales are well validated, self-rated, easy to use, and easily translatable. Within a short period of time, nonspecialists can be taught to use these in the field.

(J Clin Psychiatry 2006;67[suppl 2]:46–49)

Posttraumatic stress disorder (PTSD) and associated symptoms account for considerable morbidity and mortality.[1,2] Optimization of outcome in individuals affected by trauma and PTSD is facilitated, in part, by the application of tools to assess various components of the condition. In particular, it is crucial to establish the presence of and assess psychological resilience. Recent years have witnessed a growing interest in the concept of resilience, and resilience is now recognized to be one of the most important factors in assessing both healthy and pathologic adjustment following trauma.[3]

Resilience can be defined as a measure of stress-coping ability, and it describes personal qualities that allow individuals and communities to grow and even thrive in the face of adversity.[4–6] As such, resilience or "personality hardiness"[7] can be regarded as a measure of emotional stamina.[8] Several workers have suggested that the clinical significance of resilience may lie in its ability to function as an index of overall mental health.[9,10]

In 1982, Kobasa et al.[11] postulated that resilience is a crucial factor in determining how people react to and cope with stressful life events. This theory was later expanded by the suggestion that, when faced with such adverse experiences, resilient people tend to manifest adaptive behavior in the areas of morale, social functioning, and somatic health.[12,13] Beardslee[13] proposed that resilient people are "survivors." Indeed, Werner[14] reported that, although being born into poverty, experiencing perinatal stress, and living in troubled family environments are risk factors for children developing serious learning or behavior problems, resilient individuals who experience these factors can still grow into competent, confident adults. Furthermore, Wagnild[15(p42)] has suggested that, regardless of an individual's income, resilience may also be associated with "successful aging," defined as "the enjoyment of health and vigor of the mind, body, and spirit into middle age and beyond." Resilient older women have been found to be socially active, with mid-to-high scores for measures of life satisfaction.[8]

Although disturbing life events increase the risk of depression, most people do not become depressed following stressful experiences.[16] Recent research suggests that greater resilience, as measured by the Connor-Davidson Resilience Scale (CD-RISC)[6] total score, as well as the item of "having a sense of humor when things go badly," is predictive of greater likelihood of recovery in patients with PTSD.[17] Resilience has been shown to protect against posttrauma breakdown and may help to alleviate an individual's feelings of helplessness when faced with pressure or setback.[18] Mental hardiness may help to protect against the development of chronic PTSD following combat.[19,20] In patients with PTSD treated with fluoxetine, the drug may confer a resilience-building effect and produce clinically significant benefits.[18]

The neurobiology of resilience has been reviewed by Charney,[21] who has included patterns of neurochemical response to acute stress, together with neural mechanisms mediating fear conditioning and extinction, in an integrative model of resilience and vulnerability. Charney described 11 biochemical mediators of response to extreme stress that may be related to resilience or vulnerability, such as cortisol and dopamine. The author further noted that several neurochemicals (dehydroepiandrosterone, neuropeptide Y, galanin, serotonin, benzodiazepine receptors,

From the Department of Psychiatry and Behavioral Science, Duke University Medical Center, Durham, N.C.

Presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and supported by an educational grant from Pfizer Inc.

Corresponding author and reprints: Kathryn M. Connor, M.D., Department of Psychiatry and Behavioral Science, Duke University Medical Center, Durham, NC 27710 (e-mail: conno004@mc.duke.edu).

Table 1. Characteristics of Resilience[a]

Characteristic	Source
Internal locus of control	Kobasa, 1979[7]
Strong sense of commitment to self	
Sense of meaningfulness	
Ability to view change/stress as a challenge	
Engaging the support of others	Rutter, 1985[23]
Secure attachments to others	
Personal or collective goals	
Self-efficacy	
Sense of humor	
Strong self-esteem	
Action-oriented approach	
Ability to perceive the strengthening effect of stress	
Ability to adapt to change	
Ability to use past successes to confront current challenge	
Patience	Lyons, 1991[3]
Tolerance of negative affect	
Optimism	Connor and Davidson, 2003[6]
Faith	

Adapted with permission from Connor and Davidson.[6]

testosterone, and estrogen) may ultimately promote resilience, while the release of others (corticotropin-releasing hormone and the locus ceruleus-norepinephrine system) may tend to undermine resilience. There is also evidence that genetic factors may contribute to stress-related conditions such as PTSD.[22]

This article will focus on resilience in patients with PTSD, with 3 main aims: (1) to describe the characteristics of resilience, (2) to examine the currently available methods of assessing and quantifying resilience, and (3) to briefly discuss the use of clinical scales to assess the effect of various treatment strategies on resilience.

CHARACTERISTICS OF RESILIENCE

It is generally agreed that resilience develops over time.[12] The concept of resilience comprises several different elements,[6,17] and these are listed in Table 1.

The characteristics of resilient people have been studied since the late 1970s, when Kobasa's work[7] showed that people with greater hardiness also exhibit an internal locus of control, a stronger sense of commitment to self, a sense of meaningfulness, and an ability to view change or stress as a challenge. A variety of other salient features are also associated with resilience. Resilient people are capable of engaging the support of others; forming close, secure attachments with both personal and social networks; and striving toward personal or collective goals.[23] Such individuals exhibit a greater sense of self-efficacy together with a sense of humor when "up against it"; they have strong self-esteem and display an action-oriented approach toward solving problems.[23] Resilient individuals believe that stress can have a strengthening effect, and they are more capable of adapting to change; they can use past successes to confront current challenges.[23] Other qualities associated with resilience are patience and tolerance of negative affect,[3] as well as optimism and faith.[6]

These characteristics are substantiated by numerous studies. In the Kauai Longitudinal Study,[14] individuals were followed for more than 30 years to assess the long-term developmental consequences of perinatal complications and adverse rearing conditions in children. Resilient individuals were characterized by their personal competence and determination, the supportive relationships they had formed, and their reliance on faith and prayer. Resilient youngsters all experienced unconditional acceptance by at least one person, with most establishing this close bond early during their lives.

The beneficial character traits possessed by resilient individuals may be influenced by neural mechanisms relating to reward and motivation (hedonia, optimism, and learned helpfulness), fear and responsiveness (effective behavior in the presence of fear), and adaptive social behavior (altruism, bonding, and teamwork).[21]

Resilient individuals use positive emotions to recover from negative emotional experiences.[24] Evaluation of resilience should focus on strengths and positive attributes rather than on weaknesses, thus encouraging the individual to undertake more adaptive pursuits.[6]

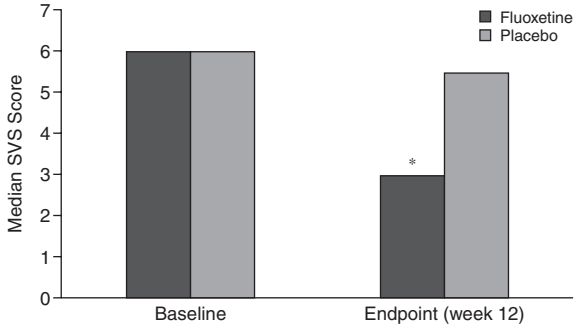
MEASURING RESILIENCE IN PATIENTS WITH PTSD

As observed by Ursano in 1987,[25(p274)] "The study of responses to trauma must include the study of resilience and health." Although a number of clinical scales have been developed to assess resilience[26,12] or aspects of resilience,[7,27] none has gained wide acceptance or established primacy.[6] Furthermore, the *Handbook of Psychiatric Measures* published in 2000 by the American Psychiatric Association[28] did not contain any measures of resilience. Limitations of the previously proposed scales left a clear need for well-validated, easy-to-use systems to be developed.

The CD-RISC can be used to measure various aspects of resilience in patients with PTSD and other allied states, as well as in healthy subjects.[6] The Stress Vulnerability Scale (SVS) can be used to measure the degree of perceived distress following everyday stress or setbacks.[29] Both the SVS and the CD-RISC are easy to use; even individuals without specialized mental health training can be taught to administer these self-rated scales in the field. In addition, both scales can be easily translated into different languages.

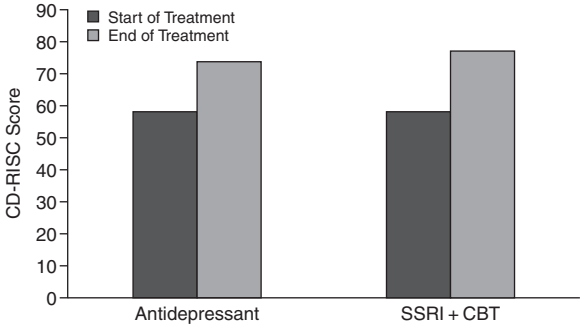
The CD-RISC is a brief, self-rated questionnaire used to quantify resilience, establish reference values, and evaluate the clinical effects of pharmacologic treatment on resilience (scale available upon request from the author).[6] It has solid psychometric properties and is able to distinguish between various degrees of illness severity. The scale consists of 25 items, each of which is rated on a 5-point scale

Figure 1. Effect of Fluoxetine Compared With Placebo on Stress Vulnerability in Patients With Posttraumatic Stress Disorder[a]



[a]Data from Connor et al.[18]
*p < .01.
Abbreviation: SVS = Stress Vulnerability Scale.

Figure 2. Effect of Pharmacotherapy or Pharmacotherapy Plus CBT on Resilience in U.S. Patients (N = 80) With Posttraumatic Stress Disorder[a]



[a]K.M.C. and J. R. T. Davidson, M.D., unpublished data, January 1, 2005.
Abbreviations: CBT = cognitive-behavioral therapy, CD-RISC = Connor-Davidson Resilience Scale, SSRI = selective serotonin reuptake inhibitor.

(0–4). Subjects determine their responses according to their feelings during the month prior to assessment. The total score ranges from 0 to 100, with greater resilience reflected in a higher score. When the scale was initially described, mean scores ranged from 80.4 for individuals in the general population to 47.8 for patients with PTSD.[6] A short, 2-item version of this scale is also available (CD-RISC-2).[6] Assessment of the reliability, validity, and factor-analytic structure of the CD-RISC found that resilience could be modified and improved by treatment in patients with PTSD, with greater improvements in resilience corresponding to greater degrees of clinical global improvement.[6]

The SVS[29] is a 1-item, 11-point, self-rated, visual analog scale, in which higher scores reflect greater stress vulnerability (e.g., impairment in resilience). Using this scale, individuals can measure their stress-coping abilities over the previous week. Results from the SVS have suggested that stress coping is more impaired in individuals with PTSD (mean SVS score = 6.3) than in individuals with other anxiety disorders (mean SVS scores: panic disorder = 5.0, social phobia = 4.8) or in the general population (mean SVS score = 3.8; K.M.C. and J. R. T. Davidson, M.D., unpublished data, July 1, 2005).

ASSESSING THE EFFECT OF TREATMENT ON RESILIENCE

The goals of treatment in patients with PTSD are to alleviate the core symptoms of the disorder and comorbid disorders, strengthen resilience, improve functioning and quality of life, and ultimately achieve remission. As resilience reflects the ability of an individual to cope with stress and adapt in the aftermath of a traumatic event, improved resiliency would be a desirable outcome during treatment, and this outcome does, in fact, occur.[17]

Responsiveness to the effects of stress was assessed with the SVS in a randomized, placebo-controlled study of fluoxetine up to 60 mg/day for 12 weeks.[18] Significantly lower median scores on the SVS scale at week 12 were found in the active drug group compared with the group of patients receiving placebo (3.0 vs. 5.5, $p < .01$; Figure 1). This significant decrease in stress vulnerability implies a "hardiness-promoting" effect of fluoxetine in patients with PTSD, a process referred to elsewhere as *saliostasis*.[17]

A recent pilot study[17] reported similarly favorable outcomes using CD-RISC scores to measure response to fluoxetine and various other treatment strategies in patients with PTSD. A statistically significant improvement with treatment was apparent for 19 of the 25 CD-RISC items. The 5 items that exhibited the highest statistical significance (all $p < .0001$) involved gaining confidence from past successes, feeling in control, having the ability to cope with stress, knowing where to turn for help, and being able to adapt to change. It was suggested that the 2 core items most closely reflective of resilience were being able to adapt to change and tending to bounce back after illness or hardship.

In another study evaluating resilience in patients with PTSD, the median baseline CD-RISC score was 58 (U.S. population reference score = 80).[6] Subjects receiving antidepressant medication in conjunction with participation in several clinical trials of PTSD were compared with those who received combined treatment with a selective serotonin reuptake inhibitor and cognitive-behavioral therapy. At the end of treatment, median CD-RISC scores increased to 74 and 77, respectively (Figure 2; K.M.C. and J. R. T. Davidson, M.D., unpublished data, January 1, 2005). These findings demonstrate substantial improvement in resilience after either pharmacotherapy or combined pharmacotherapy and psychotherapy in persons with PTSD to a level close to that observed in the general population.

Studies such as these highlight how the use of these clinical scales is enabling research to assess the efficacy of different treatments for PTSD. Data confirm that the treatment of PTSD can significantly improve resilience and thus reduce the severity of symptoms associated with the disorder. It is not currently known how psychotherapy compares to pharmacotherapy with regard to improving resilience in patients with PTSD. However, our increased understanding of resilience and our growing ability to monitor and assess its various components may help to suggest appropriate treatment interventions for individuals who do not fare well after trauma.[3]

DISCUSSION AND CONCLUSIONS

Resilience is an important area for mental health research in general and trauma research in particular. Interpreting data in this field, however, can be difficult. Resilience itself is a complex notion that is not easily reduced to any single construct and that incorporates such dimensions as coping mechanisms and personality. Further, the impact of posttraumatic symptoms on coping is unknown. The influence of this complex relationship complicates the determination of the direction of effect. These challenges have been demonstrated in studies of coping and personality in PTSD, in which there is considerable evidence about the impact of symptoms on coping measures and personality dimensions.[30–34] As a result, cross-sectional associations can be difficult to interpret in the area of study of resilience. Longitudinal studies are therefore needed to provide a prospective evaluation of the impact of characteristics thought to be indicative of resilience and to examine predictors of symptom course.

These issues notwithstanding, characteristics of resilience can be measured in patients with PTSD, as can perceived reactivity to daily stressors. Moreover, these measures can be conveniently administered by nonspecialists, who can be taught about their use within a short period of time. Although impaired in patients with PTSD, resilience can improve over time. However, longitudinal studies are needed to further our understanding of the relationships between resilience and the impact of posttraumatic symptoms on coping and of resilience as a predictor of outcome.

Drug name: fluoxetine (Prozac and others).

Disclosure of off-label usage: The author has determined that, to the best of her knowledge, fluoxetine is not approved by the U.S. Food and Drug Administration for the treatment of posttraumatic stress disorder.

REFERENCES

1. Kessler RC, Sonnega A, Bromet E, et al. Posttraumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 1995;52:1048–1060
2. Tucker P, Zaninelli R, Yehuda R, et al. Paroxetine in the treatment of chronic posttraumatic stress disorder: results of a placebo-controlled, flexible-dosage trial. J Clin Psychiatry 2001;62:860–868
3. Lyons J. Strategies for assessing the potential for positive adjustment following trauma. J Trauma Stress 1991;4:93–111
4. Luthar SS, Cicchetti D, Becker B. The construct of resilience: a critical evaluation and guidelines for future work. Child Dev 2000;71:543–562
5. Richardson GE. The metatheory of resilience and resiliency. J Clin Psychol 2002;58:307–321
6. Connor KM, Davidson JRT. Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). Depress Anxiety 2003;18:76–82
7. Kobasa SC. Stressful life events, personality, and health: an inquiry into hardiness. J Pers Soc Psychol 1979;37:1–11
8. Wagnild G, Young HM. Resilience among older women. Image J Nurs Sch 1990;22:252–255
9. Maddi SR, Khoshaba DM. Hardiness and mental health. J Pers Assess 1994;63:265–274
10. Ramanaiah NV, Sharpe JP, Byravan A. Hardiness and major personality factors. Psychol Rep 1999;84:497–500
11. Kobasa SC, Maddi SR, Kahn S. Hardiness and health: a prospective study. J Pers Soc Psychol 1982;42:168–177
12. Wagnild GM, Young HM. Development and psychometric evaluation of the Resilience Scale. J Nurs Meas 1993;1:165–178
13. Beardslee WR. The role of self-understanding in resilient individuals: the development of a perspective. Am J Orthopsychiatry 1989;59:266–278
14. Werner EE. The children of Kauai: resiliency and recovery in adolescence and adulthood. J Adolesc Health 1992;13:262–268
15. Wagnild G. Resilience and successful aging: comparison among low and high income older adults. J Gerontol Nurs 2003;29:42–49
16. Paykel ES. Contribution of life events to causation of psychiatric illness. Psychol Med 1978;8:245–253
17. Davidson JR, Payne VM, Connor KM, et al. Trauma, resilience and saliostasis: effects of treatment in post-traumatic stress disorder. Int Clin Psychopharmacol 2005;20:43–48
18. Connor KM, Sutherland SM, Tupler LA, et al. Fluoxetine in post-traumatic stress disorder. Br J Psychiatry 1999;175:17–22
19. King LA, King DW, Fairbank JA, et al. Resilience-recovery factors in post-traumatic stress disorder among female and male Vietnam veterans: hardiness, postwar social support, and additional stressful life events. J Pers Soc Psychol 1998;74:420–434
20. Waysman M, Schwarzwald J, Solomon Z. Hardiness: an examination of its relationship with positive and negative long term changes following trauma. J Trauma Stress 2001;14:531–548
21. Charney DS. Psychobiological mechanisms of resilience and vulnerability: implications for successful adaptation to extreme stress. Am J Psychiatry 2004;161:195–216
22. True WR, Rice J, Eisen SA, et al. A twin study of genetic and environmental contributions to liability for posttraumatic stress symptoms. Arch Gen Psychiatry 1993;50:257–264
23. Rutter M. Resilience in the face of adversity: protective factors and resistance to psychiatric disorder. Br J Psychiatry 1985;147:598–611
24. Tugade MM, Fredrickson BL. Resilient individuals use positive emotions to bounce back from negative emotional experiences. J Pers Soc Psychol 2004;86:320–333
25. Ursano RJ. Posttraumatic stress disorder: the stressor criterion. J Nerv Ment Dis 1987;175:273–275
26. Bartone PT, Ursano RJ, Wright KM, et al. The impact of a military air disaster on the health of assistance workers: a prospective study. J Nerv Ment Dis 1989;177:317–328
27. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J Health Soc Behav 1983;24:385–396
28. American Psychiatric Association. Handbook of Psychiatric Measures. Washington, DC: American Psychiatric Association; 2000
29. Sheehan DV, Raj AB, Harnett SK. Is buspirone effective for panic disorder? J Clin Psychopharmacol 1990;10:3–11
30. Chang CM, Lee LC, Connor KM, et al. Posttraumatic distress and coping strategies among rescue workers after an earthquake. J Nerv Ment Dis 2003;191:391–398
31. Cox BJ, MacPherson P, Enns MW, et al. Neuroticism and self-criticism associated with posttraumatic stress disorder in a nationally representative sample. Behav Res Ther 2004;42:105–114
32. Gunderson J, Sabo A. The phenomenological and conceptual interface between borderline personality disorder and PTSD. Am J Psych 1993;150:19–27
33. Miller MW. Personality and the etiology and expression of PTSD: a three-factor model perspective. Clin Psychol 2003;10:373–393
34. O'Toole BI, Marshall RP, Schureck RJ, et al. Posttraumatic stress disorder and comorbidity in Australian Vietnam veterans: risk factors, chronicity, and combat. Aust N Z J Psych 1998;32:32–42

Recovery After the Tsunami: Timeline for Rehabilitation

Richard A. Bryant, Ph.D.

In the aftermath of the Asian tsunami, there is potentially a large, traumatized population in need of psychosocial support, but determining which individuals require psychological intervention and knowing how and when to treat them may be the key to positive long-term outcomes. The early identification of people at high risk of developing subsequent psychiatric disorders from among those experiencing a transient stress reaction following trauma is often the initial step in the recovery process. Clinical instruments for screening and/or predicting those most at risk are available and require validating for cultural and linguistic sensitivity. Timely treatment is essential, since inappropriately targeted therapy can compromise recovery and may even exacerbate posttraumatic stress symptoms, particularly if treatment is initiated before grief reactions have subsided. Finally, appropriate treatment interventions, which incorporate cognitive-behavioral therapy and prolonged exposure, offer the best current therapeutic options for the treatment of posttraumatic stress disorder and associated comorbid conditions such as anxiety, depression, and grief. However, since most of the supportive data for the psychosocial consequences of trauma were obtained from small-scale studies of discrete trauma events in Western countries, it may not be possible to extrapolate these findings to a large-scale natural disaster in Asia, such as the Asian tsunami. More data are required to assist in the development of strategies for the effective management of the psychological consequences of trauma worldwide, with emphasis on creating mental health strategies that are culturally sensitive and valid for various trauma events and disaster scenarios. *(J Clin Psychiatry 2006;67[suppl 2]:50–55)*

The Asian tsunami devastated communities and families in Indonesia, Sri Lanka, India, and Thailand, and the psychological consequences of this natural disaster are immense. An extensive and multidisciplinary literature on this subject exists[1,2]; can mental health strategies used after previously reported trauma events assist us in managing the psychosocial outcomes following the Asian tsunami? Firstly, it must be realized that no 2 traumas or disasters are the same and that even well-performed studies cannot fully instruct us about the implications for mental health following a disaster in another place at another time. Secondly, most of the treatment studies in the literature have reported on trauma events experienced in Western countries where the social, cultural, and religious environments differ greatly from the community- and family-based structures of Asian societies. Thirdly, these studies have mostly examined discrete trauma events such as rape, crime, motor vehicle accidents (MVAs), and industrial accidents[3–6] and not the impact of large-scale natural disasters that involve extensive devastation, large populations, widespread grief, and ongoing social and logistical problems. However, many of the studies conducted in recent years have examined the effects of such disasters, and their findings have shed new light on risk and protective factors and on mechanisms and processes that influence survivors' mental health.[1]

Almost all individuals who suffer a trauma event show symptoms of distress in the immediate aftermath of the event. In fact, virtually all posttraumatic stress disorder (PTSD) symptoms are reported at markedly elevated rates in the initial weeks after trauma exposure.[7] This is accepted as a normal reaction to trauma and is not an indicator of an emerging psychiatric disorder. Most people affected by a trauma event will adapt in a period of 3 to 6 months following trauma,[8–10] and only a small proportion will develop long-term psychiatric disorders.[7] These reports suggest that treating all people after trauma is not necessary or indicated. For effective mental health management, it is the early identification of people at high risk of developing subsequent psychiatric disorders from

From the School of Psychology, University of New South Wales, Sydney, New South Wales, Australia.

This review was supported by grant #300304 from the National Health and Medical Research Council Program (Australia).

Presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and supported by an educational grant from Pfizer Inc.

Corresponding author and reprints: Richard A. Bryant, Ph.D., School of Psychology, University of New South Wales, Sydney, NSW, 2052, Australia (e-mail: r.bryant@unsw.edu.au).

among those experiencing a transient stress reaction, and appropriate treatment interventions, that may be the key to positive long-term outcomes.

Once people at high risk for developing a subsequent psychiatric disorder have been identified, it is important to answer the following questions: Is early intervention more effective than long-term evaluation and treatment? What role does grief assessment have in recovery? Which of the available therapies are most effective? This article will address these questions in an attempt to describe the recovery process following trauma and to indicate a timeline for rehabilitation.

EARLY RESPONSES AFTER A DISASTER

Even though almost all symptoms of PTSD are reported at markedly elevated rates in the initial weeks after a trauma, this is considered a normal response to a traumatic event. In this context, it is important to differentiate distress and unhappiness from an incipient psychiatric disorder, since most people will adapt in the 3 to 6 months after a trauma. Grief is also a normal response in the early aftermath of a disaster, and it is highly culturally specific. Most cultures have their own particular grief rituals/ceremonies, and these play an important part in the overall trauma recovery process.

After a trauma, the victims need to receive assistance in order of priority. Practical requirements (food, water, housing, sanitation) should take precedence, followed by grief and emotional support and then psychological interventions for those people experiencing acute stress disorder (ASD) and/or PTSD. However, the timing of treatment after a major disaster should not be measured in days, weeks, or months from the disaster itself but must be related directly to when the trauma has finally subsided. The following factors are important in attempting to determine when the trauma actually ends: availability of resources such as food, water, housing, and sanitation; knowledge of the fate of loved ones; and social stability and resolution of chaos.

Psychiatric support mechanisms are often not available to provide effective and appropriate early intervention in the immediate aftermath of a major disaster such as the Asian tsunami. Given these limited resources, it is important to identify those who will benefit most from treatment through screening and monitoring programs.

WHO TO TREAT: PREDICTORS OF AND SCREENING FOR PSYCHIATRIC DISORDERS AFTER DISASTERS

It would be helpful to be able to identify people at risk for subsequent psychiatric disorders, since early intervention could then be used to prevent the development of such disorders. Accumulating evidence over the past decade has shown the potential benefit of treating people several weeks after a traumatic event.[3,11,12]

A major reason for the introduction of ASD in the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition,[13] was to identify acute posttraumatic stress reactions that are precursors of chronic PTSD.[14] To meet the criteria for ASD, one must experience a stressor and respond with fear or helplessness (criterion A) and have at least 3 of 5 dissociative symptoms (criterion B), at least 1 reexperiencing symptom (criterion C), marked avoidance (criterion D), and marked arousal (criterion E). Acute stress disorder describes posttraumatic stress reactions that occur between 2 days and 4 weeks following a trauma.[14] Although ASD is conceptually similar to PTSD, it has a stronger emphasis on dissociative symptoms, and this diagnosis was introduced to identify acutely traumatized people who would suffer long-term PTSD.[15] Dissociation is a reaction that can decrease distress by "numbing" an individual, thereby reducing the distress that may be perceived. It can arguably limit the processing of a traumatic experience and subsequently impede adapting. Dissociation has sometimes been found to be highly predictive of PTSD.[16,17]

To date, 12 studies of ASD and PTSD following MVAs, brain injury, crime, typhoons, burns, and cancer have been conducted worldwide (Table 1). These studies have shown that although ASD is highly predictive of PTSD, screening for ASD misses many people who develop PTSD. It has been reported that the majority of patients with diagnosed ASD subsequently developed PTSD (72%–83%),[16–22] while in studies of patients who developed PTSD, < 50% were initially identified as experiencing ASD.[16,17,19,23–25] This evidence indicates that although ASD may be highly predictive of subsequent PTSD, many trauma survivors can develop PTSD without initially displaying ASD. Consequently, current data challenge the utility of ASD in accurately identifying the traumatized population at risk of developing PTSD, and it has been suggested that the ASD diagnosis should not be included in the DSM-V,[7] since no symptom, or constellation of symptoms, has been shown to be particularly predictive of PTSD. Nonetheless, the results from prospective studies have established that individuals with very high levels of distress frequently develop PTSD, suggesting that it may be more effective to focus on this distressed population when considering psychiatric interventions.

The introduction of ASD in the DSM-IV raised the need for standardized instruments to measure ASD, and there are now various screening instruments developed for this purpose. The Acute Stress Disorder Interview (ASDI)[4] is a 19-item structured clinical interview that has been validated against independent clinical diagnosis based on DSM-IV criteria. The ASDI has proven sensitivity (91%) and specificity (93%) and good psychometric properties and is user-friendly, but lacks ordinal scales. The ASDI

Table 1. Relationship Between Acute Stress Disorder (ASD) and Posttraumatic Stress Disorder (PTSD) in Various Populations

Trauma	Country	Time Since Trauma	Patients With ASD Who Developed PTSD, %	PTSD Patients With Initial ASD, %
Burn[47]	United States	6 mo	87	78
Typhoon[25]	Guam	8 mo	30	37
Brain injury[16]	Australia	6 mo	82	40
Assault[18]	United Kingdom	6 mo	83	57
MVA[17]	Australia	6 mo	78	39
MVA[19]	Australia	2 y	82	29
Brain injury[20]	Australia	2 y	80	72
MVA[21]	United Kingdom	6 mo	72	59
MVA[24]	Switzerland	1 y	34	10
MVA[22]	United Kingdom	6 mo	77	34
MVA[23]	Australia	1 y	30	34
Cancer[48]	Australia	6 mo	53	64

Abbreviation: MVA = motor vehicle accident.

has been shown to successfully predict subsequent PTSD in acutely traumatized populations.[16,17] Another promising screening instrument is the Acute Stress Disorder Scale (ASDS),[26] which was developed as a self-report measure that would provide identification of ASD, a predictor of subsequent PTSD, and a self-report version of the ASDI, but included an ordinal scale for severity rating. The ASDS was found to possess good sensitivity (95%) and specificity (83%) for identifying ASD against the ASDI, although in a study of bushfire survivors, one third of those identified by the ASDS as being at risk did not develop PTSD.[26] The development of other instruments to assess or screen for risk of PTSD may be as useful at predicting future PTSD as current ASD instruments.

Many individuals will have panic attacks during a traumatic experience. Those who develop PTSD may have ongoing panic, which may perpetuate distress and prolong symptoms. Panic is common after near-drowning or suffocation experiences and consequently may be common in the Asian tsunami survivors.[27,28] Therefore, panic is an important therapeutic target in the treatment of PTSD. Interoceptive exposure, whereby the patient is exposed to internal sensations associated with panic but learns that these sensations are not dangerous, is the most effective intervention to reduce panic disorder.[29,30]

EARLY TREATMENT OPTIONS AND EFFICACY

The most common immediate psychological intervention following a disaster is psychological debriefing. Psychological debriefing has been the initial treatment of choice after a disaster in Western countries for many years. It is used in the initial days after a trauma event and involves education, advice, and disclosure of the traumatic experience. However, psychological debriefing does not appear to limit subsequent disorder, and it may even be detrimental to the stress reaction process by aggravating symptoms.[31] Significantly, authors for the Cochrane Database of Systematic Reviews have concluded that there is no evidence that single-session individual psychological debriefing is a useful treatment for the prevention of PTSD after traumatic incidents, and they recommended that compulsory debriefing of victims of trauma should cease.[31] It would appear to be more beneficial to provide victims with social support and stabilization in the initial days following a disaster.

Normal or uncomplicated grief is a natural response in the early aftermath of the death of a loved one, and most uncomplicated grief reactions are alleviated within 6 months. If the grief response does not ease, complicated grief may have developed, and this occurs in 10% to 15% of cases.[32] For this reason, the grief response needs to be monitored for more than 6 months after a trauma. Even though there are diagnostic criteria and clinical instruments available for the evaluation of complicated grief, there is at present no way of identifying those at risk at an early stage.

Therapeutic options for complicated grief are similar to those included in treatment strategies for PTSD.[33] Although there is limited evidence concerning treatment options, the best evidence supports the use of cognitive-behavioral therapy (CBT).[34] Cognitive-behavioral therapy includes exposure-type exercises, which help in the processing of the grief reaction through reliving the experience and communicating about the loss of loved ones; cognitive therapy, which confronts feelings of guilt and panic and how people are coping at the present time; and future planning to help affected people move forward by scheduling positive events and social activities and setting new goals. Early intervention may not be possible, or appropriate, for complicated grief, and whatever interventions are used to treat complicated grief must match cultural standards, since grief is highly culturally specific. Most cultures have their own particular grief rituals/ceremonies, and these play an important part in the overall trauma recovery process. It also should be appreciated that grief may mask other conditions or may be associated with comorbid conditions such as depression. Since the devel-

opment of these disorders is not linear, long-term management issues may arise.

LATE TREATMENT OPTIONS AND EFFICACY

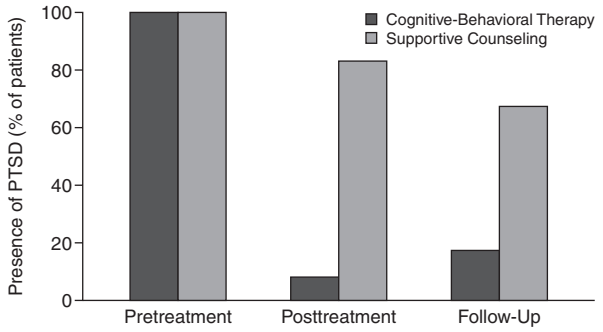
Delayed intervention, more than 6 months or even years after a traumatic event, has been shown to be as effective as early intervention (within 6 months). Specifically, the effect sizes of therapy offered in the initial month after trauma[3,12] are comparable to the effect sizes in treatments offered several years after trauma exposure.[35,36] Further, early treatment may be harmful in some cases.[37]

Cognitive-behavioral therapy is a combination of therapies, including education about the rationale for treatment, anxiety management techniques, cognitive therapy, and prolonged exposure (PE; see Foa, "Psychosocial Therapy," this supplement). The rationale for treatment needs to be individually appropriate and the treatment approach clear to both the therapist and the patient. Without understanding of the rationale, there will be no motivation to overcome the common difficulties encountered during treatment. Cognitive-behavioral therapy is the optimal psychosocial approach to treat PTSD and comorbid conditions such as anxiety, depression, and grief, as evidenced by the inclusion of CBT in all practice guidelines worldwide. Cognitive-behavioral therapy is an effective treatment for patients with chronic PTSD,[5,35,36,38–42] particularly for those patients who have suffered a discrete trauma.[5,35,36,38,40]

Nevertheless, there are limitations to the application of CBT following trauma. In intent-to-treat analyses, only 2 in 3 people were reported to benefit from treatment.[43] Cognitive-behavioral therapy requires considerable resources for one-to-one consultations, and therapy cannot be started until the trauma has ceased. This last point is particularly important because active CBT can be harmful if the acute trauma is ongoing.[37] Given that late CBT can be as effective as early CBT in the treatment of PTSD and associated symptoms,[3,12,35,36] it may be more beneficial to delay CBT until the trauma has demonstrably ceased. Exposure is arguably the most potent factor in CBT, although cognitive therapy can be as effective. Combining cognitive therapy and PE has not been shown to lead to better outcomes than providing PE alone, however.[36,38]

In 5% to 10% of PTSD cases, onset is delayed for 6 months or more after the trauma.[44–46] Delayed onset can be more common in aid/relief workers, military personnel, and other people who have had responsibilities during a crisis. Delayed onset arises after adjustment to "normal life," with compounding stressors such as overwhelming responsibilities, or with exposure to further traumas. Individuals exposed to the most distressing experiences may need ongoing assessment. Adjustment problems and grief can be common after injury, loss of home, and bereavement, for example, and so screening measures may be useful for PTSD, grief, depression, and associated comorbid conditions months after the trauma for these at-risk groups.

Figure 1. Prevention of Posttraumatic Stress Disorder (PTSD) in Patients With Acute Stress Disorder Immediately After 5 Treatment Sessions Starting Within 2 Weeks of Trauma and at 6 Months' Follow-Up[a]

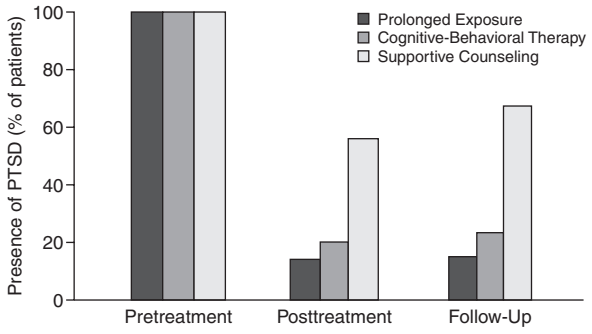


[a]Data from Bryant et al.[3]

PRACTICALITY OF TREATMENT AFTER A MAJOR DISASTER

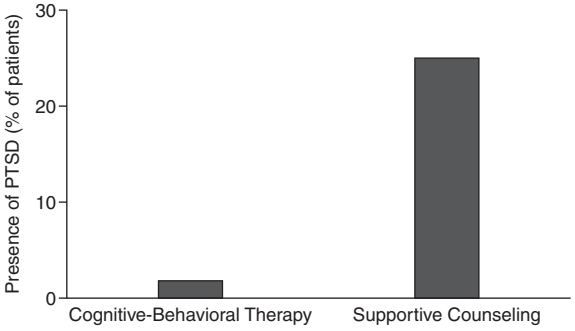
Following a major disaster, the primary goals in the initial 1 to 2 months are to restore stability, improve social networks, decrease hyperarousal, and help natural recovery. Screening for ASD/PTSD is only useful when there are resources in place to offer intervention, and, following the Asian tsunami, psychiatric support mechanisms were not available to provide effective and appropriate early intervention in its immediate aftermath. In addition, if resources were made available at a later date, it would be too late to screen for people most at risk. There is evidence that early intervention can prevent the development of long-term mental disorders, such as PTSD.[3,5,6,11,12] For example, CBT can prevent development of PTSD in patients with ASD who complete treatment (Figures 1 and 2),[3,12] and results of CBT in ASD patients have been sustained for up to 4 years (Figure 3).[5] Other studies have reported similar results,[11] and a recent study suggests that the treatment effects of CBT may be facilitated by the use of hypnosis.[6] However, most of the available evidence comes from prospective studies performed after discrete trauma events such as rape, crime, MVAs, and industrial accidents,[3,5,6,12] for which the trajectory of recovery can be predicted. It may not be possible to extrapolate these findings to victims of a major disaster, such as the Asian tsunami, which is not a discrete event and for which the trajectory of recovery is unknown because of community devastation, widespread grief, and ongoing social and logistical problems.

Figure 2. Prevention of Posttraumatic Stress Disorder (PTSD) in Patients With Acute Stress Disorder Immediately After 5 Treatment Sessions Starting Within 2 Weeks of Trauma and at 6 Months' Follow-Up[a]



[a]Data from Bryant et al.[3]

Figure 3. Long-Term Benefits (as measured by prevention of posttraumatic stress disorder [PTSD]) of Early Provision of Cognitive-Behavioral Therapy Versus Supportive Counseling to Trauma Survivors With Acute Stress Disorder[a]



[a]Data from Bryant et al.[5]

SUMMARY AND CONCLUSION

Even though most of the established literature on the psychosocial consequences of trauma events describes discrete trauma events studied in Western countries,[3,5,6,12] more recent data are shedding new light on the effects of disasters globally, particularly on risk and protective factors and on mechanisms and processes that influence survivors' mental health.[1] This new information will hopefully assist in the development of strategies for the effective management of the psychological implications of trauma worldwide, with emphasis on creating mental health strategies that are culturally sensitive and valid for various trauma events and disaster scenarios.

Studies have shown that treatment following a trauma event should be targeted at individuals with very high levels of distress rather than those presenting with ASD symptoms only. However, treatment should be provided only when patients are in a position to cope with it, that is, once external stability has been restored and the initial grief reaction has subsided. Since late treatment has been shown to be as effective as early intervention, it is more beneficial for patients to establish normal social networks before starting therapy. Cognitive-behavioral therapy is considered the optimal therapeutic option, both for early intervention and for later (delayed) treatment. Exposure may be the most potent element of CBT and is easier to administer and train therapists to use than are other components of CBT, particularly when large populations are affected that require treatment. Although early intervention is effective and leads to long-term gains, it is no better than later treatment and it may do more harm if administered inappropriately.

Before early treatment is considered, it is essential that people's initial grief response be considered. At this time, there is no evidence that early intervention for grief is indicated; in fact, one should allow the natural grief process to occur. If one is suffering from chronic PTSD and complicated grief, it may be beneficial to initially treat the PTSD symptoms and then proceed to addressing the complicated grief reactions. In doing so, however, it is important to be aware that grief is highly culturally specific and that most cultures have their own particular grief rituals/ceremonies, which play an important part in the overall trauma recovery process.

In determining the timeline for psychosocial rehabilitation, it is important to not interfere with natural adaptation processes that can assist individuals and communities. In the context of the Asian tsunami, mental health strategies need to be integrated into the social and organizational restructuring that occurs in the months and years after a disaster of this magnitude. Although lessons learned from strategies developed in the West can be helpful, these approaches must be adapted and evaluated in the contexts of the tsunami-affected regions in which they are to be employed.

Disclosure of off-label usage: The author has determined that, to the best of his knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling has been presented in this article.

REFERENCES

1. Norris FH, Friedman MJ, Watson PJ, et al. 60,000 disaster victims speak: part I. An empirical review of the empirical literature, 1981–2001. Psychiatry 2002;65:207–239
2. Norris FH, Friedman MJ, Watson PJ. 60,000 disaster victims speak: part II. Summary and implications of the disaster mental health research. Psychiatry 2002;65:240–260
3. Bryant RA, Harvey AG, Dang ST, et al. Treatment of acute stress disorder: a comparison of cognitive-behavioral therapy and supportive counseling. J Consult Clin Psychol 1998;66:862–866
4. Bryant RA, Harvey AG, Dang ST, et al. Assessing acute stress disorder: psychometric properties of a structured clinical interview. Psychol Assess 1998;10:215–220

5. Bryant RA, Moulds ML, Nixon RV. Cognitive behaviour therapy of acute stress disorder: a four-year follow-up. Behav Res Ther 2003;41:489–494
6. Bryant RA, Moulds ML, Guthrie RM, et al. The additive benefit of hypnosis and cognitive-behavioral therapy in treating acute stress disorder. J Consult Clin Psychol 2005;73:334–340
7. Bryant RA. Predictors of posttraumatic stress disorder. Biol Psychiatry 2003;53:789–795
8. Blanchard EB, Hickling EJ, Barton KA, et al. One-year prospective follow-up of motor accident victims. Behav Res Ther 1996;34:775–786
9. Riggs DS, Rothbaum BO, Foa EB. A prospective examination of symptoms of posttraumatic stress disorder in victims of nonsexual assault. J Interpers Violence 1995;10:201–214
10. Rothbaum BO, Foa EB, Riggs DS, et al. A prospective examination of post-traumatic stress disorder in rape victims. J Trauma Stress 1992;5: 455–475
11. Foa EB, Hearst-Ikeda D, Perry KJ. Evaluation of a brief cognitive-behavioral program for the prevention of chronic PTSD in recent assault victims. J Consult Clin Psychol 1995;63:948–955
12. Bryant RA, Sackville T, Dang ST, et al. Treating acute stress disorder: an evaluation of cognitive behavior therapy and supportive counseling techniques. Am J Psychiatry 1999;156:1780–1786
13. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington, DC: American Psychiatric Association; 1994
14. Bryant RA, Harvey AG. Acute stress disorder: a critical review of diagnostic issues. Clin Psychol Rev 1997;17:757–773
15. Koopman C, Classen C, Spiegel D. Predictors of posttraumatic stress symptoms among survivors of the Oakland/Berkeley, Calif, firestorm. Am J Psychiatry 1994;151:888–894
16. Bryant RA, Harvey AG. Relationship between acute stress disorder and posttraumatic stress disorder following mild traumatic brain injury. Am J Psychiatry 1998;155:625–629
17. Harvey AG, Bryant RA. The relationship between acute stress disorder and posttraumatic stress disorder: a prospective evaluation of motor vehicle accident survivors. J Consult Clin Psychol 1998;66:507–512
18. Brewin CR, Andrews B, Rose S, et al. Acute stress disorder and posttraumatic stress disorder in victims of violent crime. Am J Psychiatry 1999; 156:360–366
19. Harvey AG, Bryant RA. The relationship between acute stress disorder and posttraumatic stress disorder: a 2-year prospective evaluation. J Consult Clin Psychol 1999;67:985–988
20. Harvey AG, Bryant RA. Two-year prospective evaluation of the relationship between acute stress disorder and posttraumatic stress disorder following mild traumatic brain injury. Am J Psychiatry 2000;157:626–628
21. Holeva V, Tarrier N, Wells A. Prevalence and predictors of acute stress disorder and PTSD following road traffic accidents: thought control strategies and social support. Behav Ther 2001;32:65–83
22. Murray J, Ehlers A, Mayou RA. Dissociation and post-traumatic stress disorder: two prospective studies of road traffic accident survivors. Br J Psychiatry 2002;180:363–368
23. Creamer M, O'Donnell ML, Pattison P. The relationship between acute stress disorder and posttraumatic stress disorder in severely injured trauma survivors. Behav Res Ther 2004;42:315–328
24. Schnyder U, Moergeli H, Klaghofer R, et al. Incidence and prediction of posttraumatic stress disorder symptoms in severely injured accident victims. Am J Psychiatry 2001;158:594–599
25. Staab JP, Grieger TA, Fullerton CS, et al. Acute stress disorder, subsequent posttraumatic stress disorder and depression after a series of typhoons. Anxiety 1996;2:219–225
26. Bryant RA, Moulds ML, Guthrie RM. Acute Stress Disorder Scale: a self-report measure of acute stress disorder. Psychol Assess 2000;12:61–68
27. Alkin T. Near-drowning experiences and panic disorder [letter]. Am J Psychiatry 1999;156:667
28. Bouwer C, Stein DJ. Association of panic disorder with a history of traumatic suffocation. Am J Psychiatry 1997;154:1566–1570
29. Meuret AE, Ritz T, Wilhelm FH, et al. Voluntary hyperventilation in the treatment of panic disorder: functions of hyperventilation, their implications for breathing training, and recommendations for standardization. Clin Psychol Rev 2005;25:285–306
30. Wald J, Taylor S. Interoceptive exposure therapy combined with trauma-related exposure therapy for post-traumatic stress disorder: a case report. Cogn Behav Ther 2005;34:34–40
31. Rose S, Bisson J, Churchill R, et al. Psychological debriefing for preventing post traumatic stress disorder (PTSD). Cochrane Database of Systematic Reviews 2002;Issue 2:CD000560
32. Bonanno G. Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? Am Psychologist 2004;59:20–28
33. Shear K, Frank E, Foa EB, et al. Traumatic grief treatment: a pilot study. Am J Psychiatry 2001;158:1506–1508
34. Shear K, Frank E, Houck PR, et al. Treatment of complicated grief: a randomized controlled trial. JAMA 2005;293:2601–2608
35. Foa EB, Rothbaum BO, Riggs DS, et al. Treatment of posttraumatic stress disorder in rape victims: a comparison between cognitive-behavioral procedures and counseling. J Consult Clin Psychol 1991;59:715–723
36. Foa EB, Dancu CV, Hembree EA, et al. A comparison of exposure therapy, stress inoculation training, and their combination for reducing posttraumatic stress disorder in female assault victims. J Consult Clin Psychol 1999;67:194–200
37. Bryant RA, Harvey AG. Acute Stress Disorder: A Handbook of Theory, Assessment, and Treatment. Washington, DC: American Psychological Association; 2000
38. Marks I, Lovell K, Noshirvani H, et al. Treatment of posttraumatic stress disorder by exposure and/or cognitive restructuring: a controlled study. Arch Gen Psychiatry 1998;55:317–325
39. Tarrier N, Sommerfield C, Pilgrim H, et al. Cognitive therapy or imaginal exposure in the treatment of post-traumatic stress disorder: twelve-month follow-up. Br J Psychiatry 1999;175:571–575
40. Taylor S, Fedoroff IC, Koch WJ, et al. Posttraumatic stress disorder arising after road traffic collisions: patterns of response to cognitive-behavior therapy. J Consult Clin Psychol 2001;69:541–551
41. Cloitre M, Koenen KC, Cohen LR, et al. Skills training in affective and interpersonal regulation followed by exposure: a phase-based treatment for PTSD related to childhood abuse. J Consult Clin Psychol 2002;70: 1067–1074
42. Resick PA, Nishith P, Griffin MG. How well does cognitive-behavioral therapy treat symptoms of complex PTSD? an examination of child sexual abuse survivors within a clinical trial. CNS Spectr 2003;8:340–355
43. Bradley R, Greene J, Russ E, et al. A multi-dimensional meta-analysis of psychotherapy for PTSD. Am J Psychiatry 2005;162:214–227
44. Buckley TC, Blanchard EB, Hickling EJ. A prospective examination of delayed onset PTSD secondary to motor vehicle accidents. J Abnorm Psychol 1996;105:617–625
45. Bryant RA, Harvey AG. Delayed-onset posttraumatic stress disorder: a prospective study. Aust N Z J Psychiatry 2002;36:205–209
46. Ehlers A, Mayou RA, Bryant B. Psychological predictors of chronic posttraumatic stress disorder after motor vehicle accidents. J Abnorm Psychol 1998;107:508–519
47. Difede J, Ptacek JT, Roberts JG, et al. Acute stress disorder after burn injury: a predictor of posttraumatic stress disorder. Psychosom Med 2002;64:826–834
48. Kangas M, Henry JL, Bryant RA. The relationship between acute stress disorder and posttraumatic stress disorder following cancer. J Consult Clin Psychol 2005;73:360–364

Lessons in Posttraumatic Stress Disorder From the Past: Venezuela Floods and Nairobi Bombing

Juan Carlos Otero, M.D., and Frank G. Njenga, F.R.C.Psych.

Identification and treatment of posttraumatic stress disorder (PTSD) are important following a disaster. Insights into how these aims can be achieved may be obtained from previous disasters. This article describes mental health initiatives following the 1999 flooding in Vargas State, Venezuela, and the 1998 U.S. Embassy bombing in Nairobi, Kenya. Following the Vargas State floods, a specialist mental health center devoted to the diagnosis, treatment, and follow-up of PTSD was established. Awareness and acceptance of the clinic was promoted by media campaigns and community-based activities. After 18 months, approximately 5000 people had been screened, of whom 62% were diagnosed with PTSD and treated. Moreover, the clinic's activities had expanded to include treatment of other medical conditions and assistance with nonmedical needs. Following the Nairobi bombing, a mass media campaign was initiated to create awareness of PTSD symptoms and help victims come to terms with their experience. This campaign was found to be well received and helpful. In addition, counselors were trained to support people living or working close to the blast. These examples show that mental health initiatives are feasible after a disaster and highlight a number of issues: (1) The intervention should be tailored to the needs of the target population; (2) Communication should be simple and appropriate; (3) Community-based activities are valuable in promoting awareness and acceptance of mental health initiatives; (4) Reducing the stigma often associated with mental health problems is important; and (5) The mass media can be helpful in promoting awareness of mental health issues following major trauma. *(J Clin Psychiatry 2006;67[suppl 2]:56–63)*

Posttraumatic stress disorder (PTSD) and other psychiatric disorders are common after natural disasters and other forms of mass trauma.[1,2] PTSD can have a severe effect on quality of life and normal functioning: compared with individuals who do not develop PTSD after exposure to trauma, people with PTSD show significantly higher rates of suicide attempts, alcohol or substance abuse, and hospitalization for psychiatric illness.[3] Prompt identification and treatment of individuals with, or at risk for, PTSD are therefore important elements of health care following major trauma.[1]

Insights into how to achieve these efforts can be obtained from the experience gained following previous major traumas. Two such examples are presented in this article, which reviews initiatives undertaken after a natural disaster (the 1999 flooding in Vargas, Venezuela) and a violent trauma (the 1998 U.S. Embassy bombing in Nairobi, Kenya). In both cases, interventions were aimed at identifying and treating patients with PTSD and raising awareness of mental health problems resulting from major trauma. These initiatives have proved successful in encouraging people affected by PTSD to present for treatment, thus offering the potential for reducing the substantial burden of psychiatric and physical morbidity that follows major disasters.

It is important to note, however, that no 2 disasters are the same: different types of natural disaster impose differing stresses on the survivors,[4] and, hence, patterns of psychiatric illness may also vary depending on the circumstances. As a result, it is essential that the response to a given disaster be tailored to the needs of the local population, taking into account cultural, social, logistic, and economic considerations.

From the Office of the General Director, Salud y Familia, Lucca, Italy (Dr. Otero); and the Department of Psychiatry, Upper Hill Medical Centre, Nairobi, Kenya (Dr. Njenga).

Presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and supported by an educational grant from Pfizer Inc.

The authors acknowledge the valuable contribution of Pfizer to this community-based partnership and the commitment of Gabriela Espinoza, M.D., (former Medical Director, Pfizer Venezuela) to this project. The authors also thank the personnel of Salud y Familia, whose enthusiasm and perseverance made this project possible.

Corresponding author and reprints: Juan Carlos Otero, M.D., I Baluardi, c/o Di Giuseppe, P.O. Box 336, Lucca Centro, Lucca LU 55100, Italy (e-mail: j.otero@virgilio.it).

INTERVENTIONS FOLLOWING THE VARGAS FLOODING

Impact of the Disaster

During December 1999, Vargas, in the northern coastal region of Venezuela, experienced exceptionally heavy rainfall, resulting in extensive flooding and a major landslide. During the 2 days before the landslide, the average rainfall was approximately 125 mm/m^2, which is approximately 5 times the normal annual rainfall for the region. The impact of the flooding was exacerbated by the mountainous nature of the region; by the fact that most of the population live in densely populated shanty towns on the outskirts of the capital, Caracas; and by the existence of only 1 major road in the region.

Together, the floods and landslide resulted in approximately 50,000 deaths. A total of 200,000 people were made homeless, with 20,000 homes destroyed and a further 40,160 affected. There was also substantial damage to the regional infrastructure, including disruption of power supplies and communication links.

Response to the Disaster

The initial response to the disaster focused on evacuating people from the affected area and restoring communications. Due to the lack of road links in the region, evacuation to refugee camps had to be performed by helicopter or boat. This evacuation imposed secondary stresses on the survivors due to enforced separation of family members; in some cases, parents were reunited with their children only after 2 months or more. Furthermore, violence and drug and alcohol abuse were widespread in the refugee camps, and regular translocation from one camp to another was also common.

Since these factors would have made long-term follow-up of individuals affected by PTSD difficult, it was decided to focus mental health initiatives in the aftermath of the disaster on those survivors who were relocated to the homes of family or friends living in the Catia La Mar region and Caraballeda. Catia La Mar is adjacent to the affected area but suffered less destruction of the infrastructure and, hence, became the principal site for settlement of those who had been made homeless in the disaster. Approximately 100,000 people were relocated to this area.

Establishing PTSD Clinics

Due to the likely high prevalence of PTSD after a disaster such as the Vargas floods, and the potentially devastating impact of this condition on patients' welfare and functioning, it was considered a priority to develop a community mental health center with a multidisciplinary team of psychiatrists, psychologists, and social workers. The primary aim of this center was to diagnose, treat, and follow up PTSD and comorbidities such as depression and anxiety disorders over a 1-year period and to perform other community services (Table 1). Secondary aims focused on helping the victims to cope with their traumatic experience and resume normal functioning, and on collecting data on mental health after the disaster that could be applied to other areas affected by such traumas (Table 1).

Table 1. Aims of the Mental Health Center Established at Catia La Mar, Venezuela, After the Vargas Floods of December 1999

Primary aim	To develop a postdisaster community mental health center with a multidisciplinary team of psychiatrists, psychologists, and social workers who will be able to diagnose, treat, and follow up posttraumatic stress disorder (PTSD) and comorbidities over 1 year, and to perform other community services
Secondary aims	To restore the capacity of the victims to cope with and manage their traumatic experience and provide assistance to enable them to resume normal functioning
	To design and implement a program to promote awareness of the emotional consequences of trauma
	To conduct a prospective, descriptive, registry-based study of patients with PTSD and associated disorders in the mental health center
	To contribute to the study of the psychosocial effects of natural disasters
	To present a model of mental health care that can be applied to other areas affected by natural disasters

The main center was located at Catia La Mar (Plaza Paez), a secure, easily accessible site in an area with a high concentration of relocated victims. In addition, mobile centers were established throughout the region in public places such as schools, churches, police stations, and hotels.

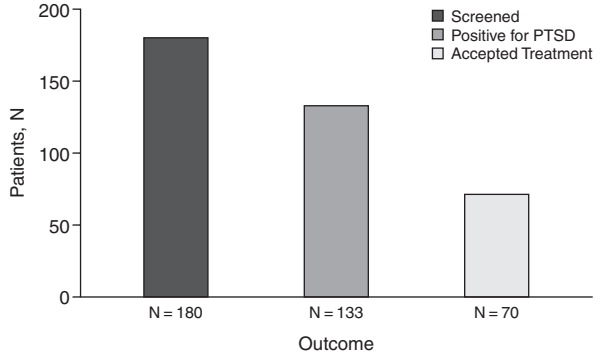
The first stage in the development of the project was a 3-day advisory board meeting involving international experts in postdisaster health care, local medical professionals and representatives from the Venezuelan Ministry of Health and Social Development, the Venezuelan Society of Psychiatry, the Central University of Venezuela, and the Venezuelan College of Neuropsychopharmacology. Local authorities, community leaders, and health centers in Catia La Mar were contacted to explain the objectives of the project and seek their cooperation. At the same time, detailed protocols for the diagnosis and treatment of PTSD were developed.

Details of the management of each patient were recorded on a 32-page multiple-choice questionnaire. To facilitate long-term follow-up, these data were stored in a registry-based database, which could be accessed via a secure Web site.

Local medical professionals were recruited to run the center and underwent a 5-day training course covering the diagnosis and treatment of PTSD. Further 1-hour training sessions were provided weekly throughout the project.

Once the center had been established, awareness and acceptance of the program were fostered by means of a media

Figure 1. Results of the Pilot Study of the Feasibility of Diagnosing and Treating Posttraumatic Stress Disorder (PTSD) in Specialist Clinics, Which Was Performed in Catia La Mar, Venezuela, Following the Vargas Floods[a]



[a]Data from an unpublished pilot study (J.C.O., Perez W, Espinoza G, et al.).

campaign involving radio, TV, and newspapers and by community-based activities in locations such as churches, schools, and pharmacies.

Diagnosing and Treating PTSD in the Mental Health Center

The feasibility of treating PTSD in specialist clinics was investigated in an unpublished pilot study (J.C.O., Perez W, Espinoza G, et al.). The health-care team involved in this initial project consisted of 4 psychiatrists, 5 psychologists, 4 social workers, and 1 child psychologist, supported by a secretary, a maintenance employee, and a security guard. A total of 180 patients took part in the pilot study. After an explanation of the project, the patients were screened for PTSD by means of the SPAN (Startle, Physiologic arousal, Anger, and Numbness) questionnaire[5] and Self-Report Questionnaire (SRQ).[6]

Overall, 74% of participants showed symptoms of PTSD according to these tests (Figure 1). This figure was higher than expected and reflects the fact that the participants were still living in the area affected by the disaster and hence were exposed to continuing reminders of the trauma. Indeed, some children were still showing symptoms of posttraumatic stress (e.g., a fear of water resulting from memories of the flooding) up to 3 years after the event. However, despite the high prevalence of PTSD in this sample, only 53% of participants were prepared to accept treatment at the center (Figure 1).

This unwillingness to accept treatment highlights the importance of reducing the stigma associated with mental illness in many societies, in order to promote acceptance of treatment among victims of PTSD (see later section: Reducing the Stigma of Mental Health Problems). In Catia La Mar, this was achieved by means of a poster campaign featuring the slogan "PTSD is a normal response to an abnormal condition." These posters, which were displayed in community buildings such as schools, police stations, churches, grocery stores, and pharmacies, described the symptoms of PTSD and emphasized that help was available. In addition, a further social worker was recruited to the mental health center to help increase awareness of PTSD among the local population. The schedule for the diagnosis and treatment of PTSD in the mental health center is shown in Figure 2.

Clinical psychologists and trained social workers screened members of the community for PTSD by means of the SPAN and the 20-item SRQ.[7] In the event of a positive case result on 1 test, the patient was referred to the center.

At the center, demographic details and data on socioeconomic status were recorded by social workers. Socioeconomic data were collected because there is evidence that the risk of PTSD is higher among members of lower socioeconomic groups,[2] and members of these groups are more likely to have been previously exposed to trauma than individuals of higher socioeconomic status. Clinical staff took a full medical history and performed a psychiatric assessment.

Patients who were diagnosed with PTSD, depression, stress, or panic disorder according to the criteria of the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV)[8] were assigned to 2 parallel treatment regimens: weekly group psychotherapy for 3 months, and pharmacotherapy for up to 18 months with review at 2-week intervals for 8 weeks, then monthly for 3 months, and at 6-week intervals thereafter for up to 1 year.

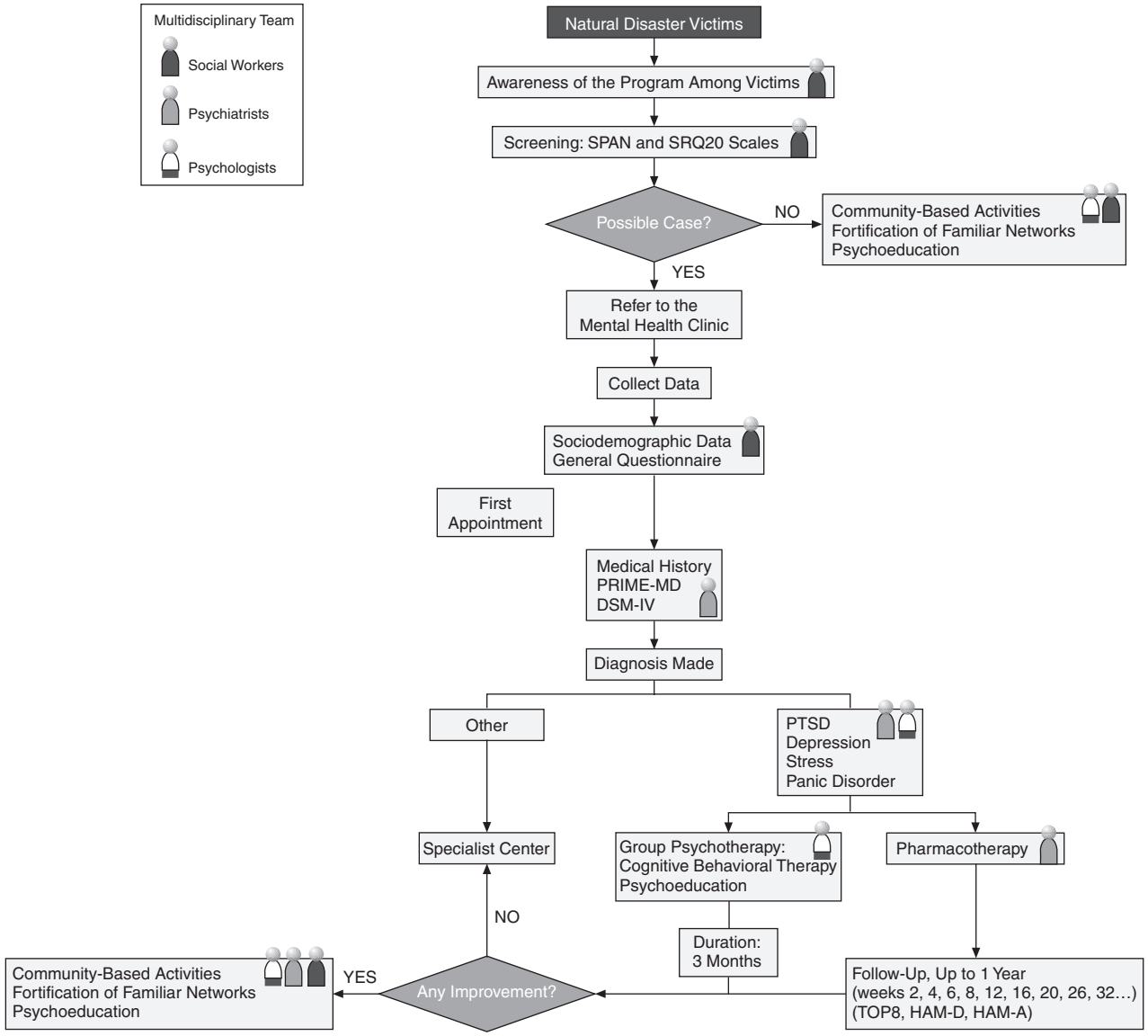
All patients were reviewed at 8-week intervals, and those who showed signs of improvement entered a program of community-based activities and psychoeducation; patients who did not respond to initial treatment were referred to a specialist center.

During long-term follow-up, the response to treatment was assessed by means of the 8-item Treatment Outcome PTSD scale[9] and the Hamilton Rating Scale for Depression (HAM-D)[10] and HAM-Anxiety.[11] An adequate response was defined as a reduction in symptoms of more than 75% maintained for at least 3 months; a partial response was defined as a 25% to 75% reduction in symptoms. Patients were considered to be refractory to treatment if they showed no response or only a slight response after drug treatment and multiple psychotherapeutic techniques.

After 1 year, a total of 1513 adults and 283 children had been treated at the center. Community-based activities, such as summer camps for children, were widely used during this period to maintain and strengthen support networks in individuals showing symptomatic improvement.

The initial multidisciplinary team was subsequently expanded to include other health-care professionals, such as general physicians and dentists, to facilitate treatment of physical and other disorders associated with PTSD. In addition, nonmedical personnel, such as lawyers and family

Figure 2. Schedule for the Diagnosis and Treatment of PTSD in the Mental Health Center at Catia La Mar, Venezuela[a]



[a]Based on an unpublished pilot study (J.C.O., Perez W, Espinoza G, et al.).
Abbreviations: HAM-A = Hamilton Rating Scale for Anxiety, HAM-D = Hamilton Rating Scale for Depression, PRIME-MD = Primary Care Evaluation of Mental Disorders, PTSD = posttraumatic stress disorder, SPAN = Startle, Physiologic arousal, Anger, and Numbness questionnaire, SRQ20 = 20-item Self-Report Questionnaire, TOP8 = 8-item Treatment Outcome PTSD Scale.

consultants, were recruited as the extent and nature of the problems faced by victims of the floods became clear. For example, many victims had lost official documents, such as deeds of land ownership; the inclusion of lawyers in the team allowed victims to be given help in obtaining replacements for these documents.

After 18 months, a total of approximately 5000 people—about 5% of the local population—had been screened and 62% of them had been diagnosed with PTSD and treated; 230 children alone received psychotherapy.

The experience following the Vargas floods shows that initiatives to diagnose and treat PTSD are feasible after major disasters. It is important to note, however, that such initiatives should include not only psychotherapy and pharmacotherapy but also community-based activities that enable patients to reach an acceptance of their experience and resume normal functioning.

INTERVENTIONS FOLLOWING THE NAIROBI, KENYA, BOMBING

Impact of the Disaster

On August 7, 1998, a 1-ton bomb was detonated outside the U.S. Embassy in Nairobi, Kenya. The blast, which

measured 2.7 on the Richter scale, killed 219 people and hospitalized a further 5000 as a result of injuries. Moreover, since the embassy was located in the financial district of Nairobi, the attack had a severe impact on Kenya's economy, with the total economic cost of the explosion estimated at 10% of Kenya's gross domestic product. Thus, in a broad sense, the entire Kenyan population was affected by the blast.[12] This is consistent with the experience from similar disasters, such as the Oklahoma City bombing,[13] which shows that trauma may affect a wider population than those involved directly.

Using the Media to Ease Fears and Provide Information

Within hours of the explosion, the Kenya Medical Association had set up a program of mass counseling, entitled "Operation Recovery," which used radio and television broadcasts and articles in the press to help create awareness of the likely psychological consequences of the disaster.[12] These efforts played an important role in providing information and in helping those affected to come to terms with their experience. An interview on CNN (Cable News Network) within 3 hours of the explosion delivered a message of hope and encouragement to Kenyans who first heard of the attack on this channel. In addition, this interview proved invaluable in disseminating information to Kenyans living abroad who were unable to contact families and friends in Nairobi because the blast had destroyed the telephone system.

A subsequent radio phone-in program, which took place 10 hours after the explosion, provided an opportunity for listeners to express their initial feelings about the attack. This program had 2 distinct effects.[12] First, listeners received professional advice about the likely psychological consequences of the bombing, which emphasized that feelings of anger, frustration, and inadequacy were normal in the early stages after such an attack. Second, many callers expressed their anger (often for the first time) at the attack and the presumed role of religion as a motivation for terrorism. Subsequently, however, callers became less angry and expressed more hopeful and conciliatory messages, including expressions of solidarity with callers who had expressed similar fears and concerns.

During the 2 days following the bombing, mental health specialists summarized events at the disaster site after each televised news broadcast and discussed psychological concerns raised by rescue workers and friends and relatives of victims. This first-hand reporting by credible specialists had an important calming effect on the population. Similarly, mental health experts used local and national radio and television broadcasts to discuss the symptoms of acute stress reactions, and these broadcasts continued for 2 weeks after the bombing. The radio broadcasts were in 3 languages: English, Kiswahili, and Kikuyu.

The effect of these media initiatives was to provide accurate, trustworthy, and easily understood information to the population at a local level. The impact of this program was evaluated in a survey of 400 residents of Nairobi and surrounding areas, who were interviewed over a 6-week period 3 months after the bombing.[12] The sample was representative of the adult population of Nairobi. This survey found that television reached the widest audience, with 89% of respondents reporting watching TV during or after the blast. The corresponding figures for radio and newspapers were 85% and 79%, respectively. A total of 32 television or radio broadcasts or newspaper articles were mentioned by 224 of the 400 respondents. Overall, 47% of respondents were already aware of Operation Recovery. Importantly, more than 95% of respondents expressed positive thoughts about the media activities. Of these, 70% felt that the programs gave hope and encouragement to the blast victims, and 60% felt that they helped the victims overcome their trauma.

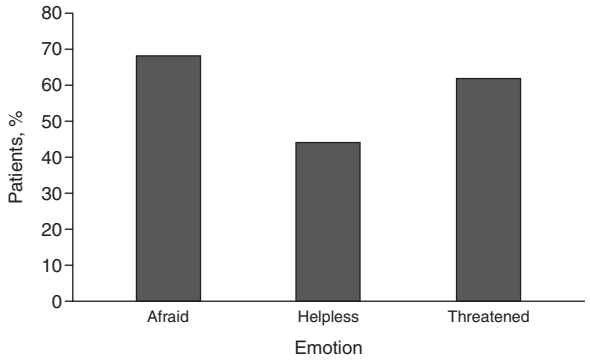
Posttrauma Counseling in Nairobi

An important issue after a disaster is that resources—both human and financial—may be limited, and, hence, it may be necessary to concentrate efforts on the highest priorities. For this reason, it was decided to focus counseling services after the bombing on members of the Nairobi population who were living or working within 1 kilometer of the explosion. This group was identified as a specific target for intervention because the injured often required psychiatric care in addition to the physical treatment received for their injuries and because many people within this group saw the event unfolding live on television.

Two groups of counselors were trained. The first group received 2 days' training in PTSD symptoms and basic support techniques; their training was carried out in churches and other places of worship. About 700 such counselors were trained during the first week after the bombing. Because Kenya has a large number of Nairobi-based, university-trained counseling psychologists, it was possible to use them as trainers. Under the supervision of psychiatrists and senior counselors, the first group was trained in groups of about 50. Trainees were taught basic skills related to debriefing, symptoms of acute stress disorder, and indications for referral, including severe depression, substance abuse, and suicidal ideation, among others. The second group was trained about 1 month after the explosion. This group included a number of preuniversity students who proved to be very effective in working with children, particularly primary school children. This success was partly due to the use of local idioms by the students, which enabled them to explain the nature of PTSD and its symptoms in a way that the children could understand.

A number of community-based activities were implemented to facilitate access to counseling, involving the use

Figure 3. Emotional Reactions Associated With Symptoms of Posttraumatic Stress Disorder Following the Nairobi, Kenya, Bombing, Reported 1 to 3 Months After the Blast[a]



[a]Data from Njenga et al.[14] All associations are statistically significant ($p < .0001$).

of mass media campaigns, places of worship, market places, trade fairs such as the annual agricultural show, and road shows. Particular attention was paid to the use of appropriate communication techniques, such as storytelling and interactive sessions, in groups with low levels of literacy. Community leaders, such as tribal chiefs, headmen, and clan leaders, were closely involved in these activities from the outset. While these activities proved to be very successful in encouraging people affected by PTSD symptoms to present for treatment, it should be noted that not all such activities may be applicable to Southeast Asian communities.

Factors Associated With PTSD After the Nairobi Bombing

Most studies of PTSD following terrorist attacks have been performed in relatively small samples from industrialized countries and have been carried out several months or years after the attack. As a result, there is little information in the literature on PTSD symptoms soon after a terrorist attack in non-Western populations. For this reason, a study was performed to assess the prevalence of symptoms corresponding to the DSM-IV criteria for PTSD, and identify potential risk factors, in the aftermath of the Nairobi bombing.[14] Symptoms were assessed 1 to 3 months after the bombing by means of a self-report questionnaire, which was completed by 2883 participants from 3 groups: patients attending a mental health clinic devoted to those affected by the bombing, workers in nearby office buildings who had requested mental health outreach services, and people who had visited information stands at various exhibitions and community events.

Complete data were available from 2627 participants. The mean age of this group was 33.6 years, and 47% were female; 46% had completed secondary school, and 40% had had some college education. Thus, this was predominantly a young, well-educated group. It was also a highly traumatized group: 91% had experienced the blast directly, and 64% had been injured in the explosion.

Table 2. Potential Lessons From the Vargas Floods and Nairobi Bombing

Tailor intervention to local needs
Describe interventions in appropriate language
Use community activities to promote acceptance of mental health issues
Involve community leaders
Aim to reduce the stigma associated with mental health problems
Use the media to ease fears and provide information

The prevalence of self-reported PTSD in this group was 35%. There were significant ($p < .0001$) correlations between posttraumatic stress and feelings of fear, helplessness, or threat (Figure 3). Bereavement and not talking about the explosion to a workmate or close friend were also significantly ($p < .05$) associated with posttraumatic stress. Demographic factors that were associated with a risk of PTSD included female gender ($p < .0001$), unmarried status ($p < .01$), and low educational status ($p < .0001$). The extent of exposure to the blast also had a marked influence on the risk of posttraumatic stress. Individuals who were in the open air at the time of the blast or who witnessed the explosion were at significant (both $p < .05$) risk of PTSD, as were those who were injured in the blast or who did not recover completely from their injuries (both $p < .0001$).

The bombing had a number of financial consequences for the participants, all of which were significantly associated with PTSD symptoms. These included current or anticipated financial difficulties (both $p < .0001$), being unable to work because of injury ($p < .01$), and receiving financial assistance ($p < .05$).

IMPLICATIONS FOR SOUTHEAST ASIAN POPULATIONS AFFECTED BY THE TSUNAMI

The experience gained following the Vargas flooding and the Nairobi bombing offers a number of potential lessons for health-care workers dealing with the aftermath of the Southeast Asian tsunami (Table 2).

Assessing the Level and Feasibility of Intervention Needed

In any major disaster, the needs of the victims are likely to outweigh the available resources.[1] Thus, as noted earlier, it may be necessary to target interventions to specific groups or populations where the greatest benefits can be achieved. However, as noted previously, no 2 disasters are alike, and each imposes its own stresses on survivors in terms of physical injury and disruption of normal life.[4] It is therefore essential that interventions should be specifically tailored to the needs of the target group or population. Doing so requires consideration of the particular stresses faced by the population, such as widespread mortality and bereavement, loss of home or livelihood, and disruption of

family and social life. Furthermore, the characteristics of the local population must be taken into account, considering such factors as educational and literacy status, cultural constraints (in some societies, for example, female health-care workers may not be acceptable to men), and social structures.

In Nairobi, for example, a special need was identified in a community located 25 kilometers from the city center. At the moment of the blast, 2 buses from that community were passing near the embassy, and many of the passengers were killed or injured. Another special-needs population comprised school children who had been participating in a music competition 1 block away from the epicenter of the blast. Many of the children were not from the city, were lost for many hours after the blast, and did not reestablish contact with their teachers or parents for several days in some cases.

The scale of the intervention will depend on the human and financial resources available. While international assistance may be available in the immediate aftermath of a disaster, long-term intervention and follow-up of victims will depend largely on local health-care workers. As a result, the capacity for long-term interventions may be limited in countries where access to specialist health-care is relatively limited. In Sri Lanka, for example, there are only about 30 psychiatrists to serve a population of 19 million, and most of these are based in the Western Province and the capital, Colombo.[15] Financial support for long-term initiatives may also be limited. It can be anticipated that a proportion of the aid promised by the international community after a disaster will fail to materialize.

Logistic issues should be considered when planning initiatives in rural or semirural areas, since access to clinics and other health-care facilities may be limited in such areas. In some suburban regions of Nairobi, for example, it was often easier for people to reach counseling centers by foot or donkey rather than by motor transport. Such considerations are likely to be particularly relevant after a major disaster, when there is often substantial damage to infrastructure such as roads.

Nonmedical personnel have important roles to play in the provision of mental health services after a disaster, and so efforts should be made to identify and encourage potential collaborators. Liaison with accountants and other financial administrators, for example, can facilitate the smooth running of mental health clinics, while information technology specialists can provide invaluable aid in setting up and maintaining computer systems. As was seen in Venezuela, lawyers can play a useful role in helping and supporting people who have lost legal documents such as records of property ownership. Partnerships with multinational corporations can also be beneficial; pharmaceutical companies, for example, may be able to provide drugs for the pharmacotherapy of PTSD and related disorders. Such partnerships, whether with individuals or commercial organizations, can foster a sense of involvement with, and contribution to, the affected community, thereby reducing the feelings of helplessness that are common after a major disaster.

The Importance of Appropriate Communication

The language used to discuss mental health issues with disaster victims should be simple and appropriate. For example, the reexperiencing symptoms of PTSD should be described in terms of "remembering" the trauma rather than "experiencing flashbacks." Communication should be "down-up," rather than "up-down," and should use local language and idioms. As noted previously, the effectiveness of pre-university students as counselors following the Nairobi bombing was partly attributable to their use of local idioms when dealing with young children.

The use of storytelling techniques and interactive sessions can also be useful, particularly in groups with low levels of literacy. Even simple approaches such as asking people to tell where they were and what they were doing when the disaster happened can allow victims to express their fears and emotions concerning the event. Similarly, interactive sessions can be helpful in groups where displays of strong emotions such as grief are not considered acceptable.

It may be appropriate in some situations to match the counselor to the target group. For example, in some countries, it may be necessary to use female counselors in girls' schools.

The Role of Community Activities

Community-based activities in centers such as schools or places of worship are helpful in promoting awareness and acceptance of mental health initiatives. Such activities might include local publicity campaigns, displays of information and patient literature on mental health issues, or road shows where people have an opportunity to meet health-care professionals to discuss their concerns.

The support of community leaders, such as local government or religious leaders, is an important factor in promoting acceptance of mental health initiatives. It is therefore essential to obtain their support at the start of the project.

Reducing the Stigma of Mental Health Problems

In many societies, there is a stigma attached to mental disorders such as PTSD. This may be associated with a perception that PTSD represents a form of psychosis and that sufferers are "crazy." The stigma may be increased and perpetuated if people with PTSD see themselves as ill—as patients with a disease. To reduce this stigma, it is important to emphasize that PTSD represents a normal response to an abnormal situation and that effective treatment can relieve the distressing symptoms and allow the individual to resume a normal life. Successful treatment of

PTSD can lead to a reduction in negative perceptions of mental illness over the course of several months after a disaster. Moreover, educational initiatives aimed at informing people without PTSD about the nature, cause, and treatment of the condition can also help to reduce the stigma associated with mental illness.

The Role of the Media

The role of the mass media in disaster management has been controversial, since some studies have suggested that vicarious exposure to trauma through television can itself produce PTSD symptoms.[12,16,17] However, the experience from both Vargas and Nairobi indicates that judicious use of the media has a valuable place in the implementation of mental health initiatives. The media can help in explaining the symptoms of PTSD in simple terms, in emphasizing that such symptoms are a natural response to trauma, and in showing the community that PTSD can be successfully treated in most patients. Both in Venezuela and in Nairobi,[12] television and radio proved to be more effective media than newspapers.

Guidelines issued by the World Health Organization recommend that, following disasters, the media should be used to provide accurate, trustworthy, and easily understood information to the local population.[18] This information should be provided in collaboration with local community leaders and representatives on the basis of dialogue between community leaders, scientists, and health-care professionals. For the media to be used most effectively, mental health workers and journalists may need training on how best to work together. Such training can be carried out locally. In Kenya, training the media is a continuous process carried out by psychiatrists with the support of industry and the media itself. Following the disaster, and recognizing that media practitioners are themselves a vulnerable group, training links were quickly made, as it is essential to ensure there are good links between mental health workers and the media before disasters.

Effective cooperation between mental health workers and the media can also be useful in assessing the scale of intervention needed after a disaster. For example, the experience from Nairobi showed that broadcasts on local radio stations could be used to help assess the extent of residual trauma after the bombing. In Nairobi, and in particular during the phone-in programs, the people clearly explained and described their pain and suffering over the radio in a way that gave a good indication of the anguish some were going through. Many callers described how their distress was similar to (or different from) a previous caller's distress.

CONCLUSIONS

The experiences from Vargas and Nairobi show that interventions to diagnose and treat PTSD after mass trauma are feasible and effective. To be most effective, however, such interventions must be tailored to the needs and circumstances of the local community. This will require careful attention to social, cultural, logistic, and economic considerations and recognition that approaches that have proved useful in one setting may not be applicable to another. The involvement of community leaders and the media is essential for the success of mental health initiatives after mass trauma, and this involvement should be sought at the earliest possible stage.

It is important to note that the survivors of major disasters will have numerous other problems in addition to their medical needs. Many will have lost their homes and livelihoods and will face major difficulties in reestablishing a normal lifestyle as a result. Therefore, the successful treatment of PTSD after mass trauma will require a holistic approach, with attention to both the medical and psychological as well as the social needs of the survivors.

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling has been presented in this article.

REFERENCES

1. Shalev AY, Tuval-Mashiach R, Hadar H. Posttraumatic stress disorder as a result of mass trauma. J Clin Psychiatry 2004;65(suppl 1):4–10
2. Norris FH, Friedman MJ, Watson PJ, et al. 60,000 disaster victims speak, pt 1: an empirical review of the empirical literature, 1981–2001. Psychiatry 2002;65:207–239
3. Warshaw MG, Fierman E, Pratt L, et al. Quality of life and dissociation in anxiety disorder patients with histories of trauma or PTSD. Am J Psychiatry 1993;150:1512–1516
4. Redmond AD. Natural disasters. BMJ 2005;330:1259–1261
5. Meltzer-Brody S, Churchill E, Davidson JR. Derivation of the SPAN, a brief diagnostic screening test for post-traumatic stress disorder. Psychiatry Res 1999;88:63–70
6. World Health Organization. A User's Guide to the Self-Report Questionnaire (SRQ). Geneva, Switzerland: World Health Organization; 1994
7. Harding TW, Climent CE, Diop M, et al. The WHO collaborative study on strategies for extending mental health care, 2: the development of new research methods. Am J Psychiatry 1983;140:1474–1480
8. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington, DC: American Psychiatric Association; 1994
9. Davidson JRT, Colket JT. The eight-item treatment outcome post-traumatic stress disorder scale: a brief measure to assess treatment outcome in post-traumatic stress disorder. Int Clin Psychopharmacol 1997;12:41–45
10. Hamilton M. A rating scale for depression. J Neurol Neurosurg Psychiatry 1960;23:56–61
11. Hamilton M. The assessment of anxiety states by rating. Br J Med Psychol 1960;32:50–55
12. Njenga FG, Nyamai C, Kigamwa P. Terrorist bombing at the USA Embassy in Nairobi: the media response. East Afr Med J 2003;80:159–164
13. Krug RS, Nixon SJ, Vincent R. Psychological response to the Oklahoma City bombing. J Clin Psychol 1996;52:103–105
14. Njenga FG, Nicholls PJ, Nyamai C, et al. Post-traumatic stress after terrorist attack: psychological reactions following the US embassy bombing in Nairobi. Br J Psychiatry 2004;185:328–333
15. Samaraweera D. Stress test. Available at: http://www.lankabusinessonline.com/full_story_search.php?newscode=1905360357&subcatcode=10. Accessed July 8, 2005
16. Terr LC, Bloch DA, Michel BA, et al. Children's thinking in the wake of Challenger. Am J Psychiatry 1997;154:744–751
17. Pfefferbaum B, Nixon SJ, Krug RS, et al. Clinical needs assessment of middle and high school students following the 1995 Oklahoma City bombing. Am J Psychiatry 1999;156:1069–1074
18. Division of Mental Health. World Health Organization, Geneva, Switzerland: 1992. WHO/MNH/PSF/91 3:30–33

Management of Trauma in Special Populations After a Disaster

Daya J. Somasundaram, M.D., F.R.C.Psych., and Willem A. C. M. van de Put, M.A., M.Phil.

Special populations are particularly vulnerable to mental health problems in the aftermath of a disaster. Efficient delivery of mental health services, the integrated use of psychosocial services and mental health facilities, and the active intervention of trained community health care workers can offer effective management of the psychosocial problems of special populations. Women, children, adolescents, the poor, the elderly, and individuals with preexisting health problems have been identified as special populations who often suffer psychological morbidity as a result of a catastrophic disaster. Understanding the cultural, ethnic, and socioeconomic factors in a postdisaster situation is crucial to helping special populations overcome debilitating mental illness and declining quality of life. Planning the delivery of mental health services is critical and includes hazard mapping to identify vulnerable geographic and social areas, screening instruments to identify at-risk populations, and education of community leaders and health care workers. An integrated approach using psychosocial and institutionalized interventions can provide better outcomes than either approach alone. A community-based approach with trained grassroots health care workers can provide effective psychosocial support and rehabilitation services. *(J Clin Psychiatry 2006;67[suppl 2]:64–73)*

The human impact of mass disaster is a composite of 2 elements: the catastrophic event itself and the vulnerability of those people affected by the event.[1] The extent and severity of injury, bereavement, damage to property and infrastructure, loss of livelihood, and loss of community all seen in the aftermath of a disaster are determined by the nature and severity of the disaster itself. Whereas the casual observer will make an assessment of impact based on these disaster manifestations as they affect the entire population, human vulnerabilities unique to special populations are often ill perceived due to the common misapprehension that disasters are the great equalizer in any society. Thus, while the severity of exposure may indicate the likely mental health impact on the entire affected population,[2] it is necessary to consider special populations within the postdisaster environment in order to identify those individuals who are most vulnerable to a long-term decline in health and quality of life and who are at greatest risk for the development of specific syndromes relevant to mental well-being.[3] Such vulnerabilities are not merely a function of severity of exposure to mass trauma but are also constructed out of the social and economic circumstances of everyday living.[4,5]

While there is little to corroborate that the impact of a disaster is undifferentiated across demographic groups, there is evidence to suggest that underlying economic and social relationships can increase human vulnerability not only during a disaster but also in the immediate aftermath and in the long-term postdisaster environment.[6,7] Any mental health program set up to identify and treat victims of disaster should, therefore, target not only areas of greatest exposure and loss but also areas of greatest need.

Women and children are special groups considered uniquely vulnerable in the context of disaster, collectively accounting for more than 75% of displaced persons.[8] Women and children are at increased risk of morbidity and mortality, are underrepresented in terms of disaster rehabilitation, and are likely to have mental illness or psychosocial disorders neglected as outcomes of disaster.[1] While there are other special populations to consider, women in particular play a central role within the family unit that is magnified in the event of a disaster, yet often ignored during relief efforts.[8] It is, therefore, imperative that any disaster preparedness planning and postdisaster relief efforts are explored through a "gender lens" to ensure that vulnerabilities are adequately mitigated.

From the Department of Psychiatry, University of Jaffna, Northern Region, Sri Lanka (Dr. Somasundaram), and the HealthNet-TPO, Amsterdam, The Netherlands (Dr. van de Put).

Presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and supported by an educational grant from Pfizer Inc.

Corresponding author and reprints: Willem van de Put, M.A., M.Phil., HealthNet-TPO, Tolstraat 127-1074 VJ Amsterdam, The Netherlands (e-mail: willem@hni.nl).

The axiom of "women and children first" is routinely overlooked in disaster preparedness[9] and is therefore given precedence in the current review. However, it is important to consider the context of any disaster to appreciate that vulnerabilities are neither transparent nor immutable. Thus, dependent on the circumstances of a particular disaster, men may constitute a special population, as was the case in Sri Lanka after the recent Asian tsunami. Other special populations include the elderly, the impoverished, ethnic minorities, class and caste groups, the poor, injured victims, those with preexisting psychiatric disorders or traumatization, and health care or relief workers exposed to the effects of mass trauma.[4,10–13]

To effectively target scarce resources aimed at mitigating the mental health consequences of mass trauma, the disaster practitioner needs to be aware not only of gender patterns and vulnerability maps[4] but also of local customs and culture. Lack of awareness may serve as a barrier to a successful outcome. Moreover, those individuals and groups involved in the provision of mental health services need to optimize and maximize the use of all available resources that can be found within affected communities to be able to meet the goal of mental well-being for all victims of disaster.

WHO ARE THE VULNERABLE IN THE AFTERMATH OF DISASTER?

Gender as a Factor in Disaster Vulnerability

Epidemiologic studies, of both postdisaster cohorts and the general population, suggest that women are more likely than men to experience mental health problems as a result of mass trauma.[14–16] Whereas lifetime prevalence of exposure to traumatic events appears to be similar for men and women, the prevalence of posttraumatic stress disorder (PTSD) in the general population is reported to be approximately 2-fold greater in women than men.[17,18] Similarly, studies among disaster survivors are consistent in their demonstration that psychiatric disorders such as *ataques de nervios* (nervous attacks), depression, somatoform disorders, and PTSD are more prevalent in women than men.[19–22]

There is a lack of data to adequately explain gender differences in vulnerability, but the general pattern of gender differentiation is apparent at all levels in the disaster setting. Thus, women not only suffer a disproportionate psychological impact compared with men but also have a greater exposure to risk arising from both biological and social factors, increased difficulty accessing relief services, more dire social and economic consequences, and a lesser role in disaster preparedness, relief, recovery, and reconstruction.[23]

Both biological and social factors are determinants of vulnerability in women. Adverse reproductive outcomes in women following disaster include miscarriage, premature delivery, stillbirth, delivery-related complications, and infertility.[23] In the aftermath of the Asian tsunami, the specific needs of women to enable their active participation in clean-up, recovery, and rebuilding efforts were identified as being the provision of sanitary supplies, privacy to ensure correct and safe use of those supplies, and replacement clothing to allow women to go out in public.[24] Similarly, gender role socialization is an important differentiator in any vulnerability assessment. Socially constructed gender roles often determine that women assume primary responsibility for others affected by disaster, including children, the sick and injured, and the elderly, thereby substantially increasing their emotional and material burden.[8] Thus, women's expanded caregiving roles and placing family needs before their own may contribute to an overall decline in emotional well-being. Furthermore, in addition to trauma that is uniformly associated with the loss of loved ones, women may be disproportionately exposed to financial hardship with the loss of a spouse and sole breadwinner.

Men, on the other hand, also may be disadvantaged by their gender roles but for different reasons from those for women.[23] As family providers and protectors, men may experience feelings of inadequacy and failure in the aftermath of a disaster that has claimed their means to provide and protect. Men also may take greater risks after a disaster, such as during any rescue and recovery efforts, exposing them to potential injury, illness, and death. However, estimates of the fatality rates after the recent Asian tsunami indicated that women were disproportionately represented among those killed, leaving the men to look after surviving family members. Whereas social and cultural customs may help prevent substance abuse for women, many men have easier access both materially and culturally to potentially abused substances. Two weeks after the tsunami, the widowed men were considered new victims; not accustomed to their emerging roles, many developed an alcohol dependency and some became suicidal. Whereas a disaster situation might typically require focusing resources on women and children, these examples demonstrate the importance of not overlooking the needs of men.

The association between gender and disaster vulnerability may not be limited to adults. Significant differences in the frequency of postdisaster stress and psychological disorders among adult male and female disaster survivors have also been observed among children and adolescents, with women and girls twice as likely to develop PTSD as men and boys.[2] While excess risk among females appears to relate more to subjective interpretation of events rather than objective exposure to disaster stressors, some females may be particularly at risk, such as those who are impoverished, those who belong to ethnic minority populations, those who have chronic disabilities or other health problems, those who lack family and com-

munity support, widows, and those with insufficient security and privacy in shelters and camps.[8]

Children and Adolescents

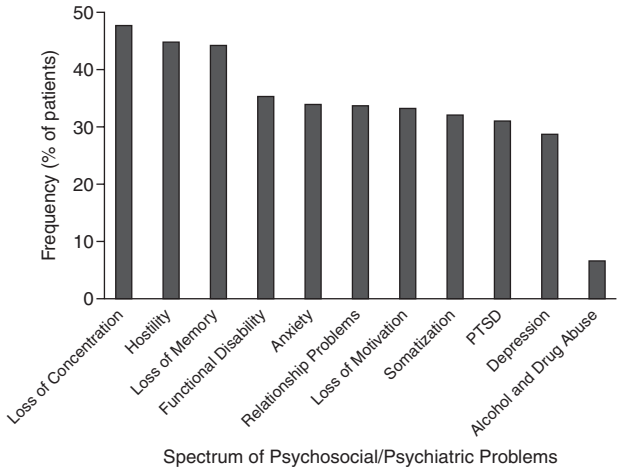
Although comparison of psychiatric responses by adult and child survivors of disaster is complicated by the tendency among researchers to consider these groups separately, disaster cohorts comprising children or adolescents are more likely in the long term to demonstrate severe impairment than adult cohorts.[2] Older children's responses to major stress are similar to those of adults, with characteristics of reexperiencing the event, avoidance, and arousal[25]; but, after a disaster, children will often demonstrate a modified sense of reality, increased vulnerability to future stress, an altered sense of the power of self, and early awareness of fragmentation and death.[26] These factors may impact the emergence of a child's personality and lead to "after-trauma" in later life if children are unable to make necessary adaptations or receive help to deal with the initial trauma. Children exposed to trauma may experience developmental delays; problems with reading, comprehension, and abstraction; and low self-esteem.[27]

Children commonly suffer disturbances in emotion and/or behavior when under stress, with disturbances in sleep with nightmares and night terrors widely prevalent following traumatic incidents.[28] One unpublished study of the psychological consequences of traumatic stress in school-aged children under age 12 years reported the following common symptoms and their frequencies. In a war milieu, such as in Northern Sri Lanka, children are exposed to terrifying experiences, such as sudden shock; dreadful noises of explosions; threat to life; witnessing the death or injury of family members; assaults and destruction of home, school, and other institutions; displacement from familiar surroundings; loss of property; death and injury to domestic animals and pets; and seeing dismembered mutilated bodies, raw flesh, and blood. They often grow up in such a milieu, knowing no other world. In Sri Lanka, these experiences have led to sleep disturbance (77%), irritability (73%), decline in school performance (60%), hyperalertness (50%), aggressiveness (46%), clinginess (45%), antisocial behavior (44%), sadness (43%), separation anxiety (40%), cruelty (30%), and withdrawal (25%) (T. Arunakirinathan, B.A.; A. Sasikanthan, M.B.B.S.; R. Sivashankar, M.B.B.S.; et al.; unpublished data; August 1993).

Children may show very little in the way of psychological response in the immediate aftermath of a disaster due to their limited conceptualization of traumatic events, but in a relatively short time they may acquire severe psychological symptoms. A survey of children from Vadamarachi in Northern Sri Lanka taken 3 weeks after the recent Asian tsunami found that of 71 children aged 7 to 15 years who had been relocated to a displaced persons' camp, all exhibited psychological symptoms, including severe numbing on the previously validated Tamil version of the UCLA PTSD Index for DSM-IV.[29] In addition, 29 children (41%) met the criteria for PTSD, with the exception of 4 weeks' duration at the time of assessment. Although PTSD is the most common psychiatric disorder in children, non-PTSD disorders characterized by mood, anxiety, sleep disturbance, behavioral problems, and learning and attention-deficit problems are also common.[25] Major factors contributing to impairment include the child's developmental level, perceptions about the response to trauma of family members, and direct exposure to the disaster.[26]

Adolescence is a critical period of transition to adulthood when childhood developmental stages and identity formation come to a climax.[28] Figure 1 shows the spectrum of psychosocial problems found among adolescents who have been exposed to trauma arising due to war (M. G. Geevathasan, M.B.B.S.; D.J.S.; S. V. Parameshwaran, Ph.D.; unpublished data; August 1993 and S. Sivashanmugarajah, M.D.; S. Kalaivany, B.A.; D.J.S.; unpublished data; August 1994). Adolescents in North Sri Lanka have grown up in a chronic civil war situation in which arbitrary detention, torture, massacres, extrajudicial killings, disappearances, rape, forced displacements, bombings, and shelling are common, as are witnessing the death or injury of their family members, destruction of social structures, and disturbances to education. Symptoms of concentration loss, hostility, loss of memory, and functional disability are relatively common in this group, while around 30% of adolescents will de-

Figure 1. Psychosocial Problems in Adolescents Involved in Disaster[a]



[a]Reproduced with permission from M. G. Geevathasan, M.B.B.S.; D.J.S.; and S. V. Parameshwaran, Ph.D., unpublished data, August 1993 and S. Sivashanmugarajah, M.D.; S. Kalaivany, B.A.; and D.J.S., unpublished data, August 1994.
Abbreviation: PTSD = posttraumatic stress disorder.

velop serious psychiatric conditions such as PTSD and depression. The symptoms of cognitive impairment are particularly worrying in this group and can lead to the erosion of identity and increased risk of militancy, migration, and simply dropping out of school.

Adolescents are particularly vulnerable during this impressionable formative period, and traumatic events during this time can cause permanent scarring of their developing personalities. It is likely that exposure of children during their formative years to insecurity, hopelessness, and violent deaths of loved ones, as well as other cruel and aggressive action and the full paraphernalia of war and its instruments of destruction, will permanently influence their development. Indications of this influence are seen in the plethora of war toys and games with which children in violent settings are so fond of playing and in their daily vocabulary. Brutalization of their personality development becomes inevitable.

Younger children's reactions must be understood within the context of the family. Their reactions are a function of the way in which reality filters down to them, so that they mirror their parents' reactions rather than directly relating to the event. The major fear at all ages is separation from parents. If this does not occur, and if the parents cope with the situation, children show little awareness of danger and minimal anxiety. However, if the parents react with fear and anxiety or lose control and discipline or if the child's regular and ordered world is changed frequently or the parents themselves are missing, the child will commonly present with disturbance in physical function (such as enuresis and functional diarrhea), emotion (such as crying spells and withdrawal), or behavior (such as clinging and temper tantrums).

Although there are a large number of agencies with influence in providing support to young children in the disaster setting, support services for adolescents may not always be addressed as effectively. After the recent Asian tsunami, schoolteachers in Sri Lanka were instrumental in implementing the psychosocial interventions of various aid agencies. In a country that used to place considerable significance on education, the effects of the war and the more recent natural disaster caused repeated disturbances in the education system and lack of access to advancement through education. As a result, skepticism about their future soon developed among many adolescents, who dropped out of school to assist their parents and look after younger children. Adolescents in these situations pose an at-risk group for substance abuse disorders, suicide, and exploitation for religious, political, or militant purposes.[30]

Other Vulnerable Populations

Disasters have their greatest impact in underdeveloped regions in which there are few alternatives for resources that are destroyed or already scarce when mass trauma occurs. In this regard, there is a clear relationship between poverty, marginalization, overpopulation, and vulnerability, with the poor being more likely to live in areas that are geographically vulnerable or lacking in sustainable agriculture, more prone to malnutrition and chronic illnesses, and less likely to have access to adequate information and education.[10] Involuntary migration as a potential consequence of disaster may further expose such individuals to impoverishment and marginalization.[5]

Socioeconomic hardship is a factor in mental health risk. Of 102 adults of low socioeconomic status forced to live in tent camps some 8 months after a major disaster, 91% of those identified by a screening instrument as being emotionally distressed met the criteria for a psychiatric disorder, with the most common diagnoses being PTSD and depression.[7] To place this finding in perspective, living in a developed country when disaster occurs appears to mitigate the impact of trauma exposure, with fewer disaster cohorts from developed countries demonstrating severe mental health impairment compared with those of developing countries.[2]

Ethnic minorities, the elderly, and those individuals with preexisting disablement or health problems are also recognized in the literature as having an increased risk for mental health impairment in the event of a disaster.[2,4,11,12] While ethnic differences in psychological impairment may be explained by other risk factors such as socioeconomic status, chronic adversity, and differential exposure to disaster, Norris and Alegria[11] have reported that ethnicity and culture influence an individual's perception on need for help, on availability and accessibility of help, on help-seeking comfort, and on the probability that help is provided adequately. Moreover, marginalized groups such as ethnic minorities and deprived class and caste groups are often excluded from disaster planning initiatives with the result that response programs do not have a solid basis for understanding and reacting to the cultural differences that are a part of most societies.[4]

Debate continues as to whether elderly people react similarly to traumatic events compared with younger age groups or are more vulnerable to such events. However, it is likely that vulnerability in the elderly is related more to preexisting health than to age per se, with impaired physical mobility, diminished sensory awareness, and chronic health conditions potentially contributing to a reduced capacity to adapt in the disaster setting.[31] One study of 148 community residents exposed to 2 separate disaster events found there was no difference in posttraumatic responses in young, middle-aged, and elderly age groups, with level of intrusive thoughts and avoidance behavior determining health outcomes in the group as a whole.[32] However, 2 other disaster cohorts of older adults found that middle-aged people were at an increased risk of psychological symptoms compared with the entire sample.[33,34]

The relationship between preexisting health status and vulnerability in the disaster setting is not just a function of age but is consistently demonstrated across the entire population. Thus, individuals with previous psychiatric illness, family history of mental illness, childhood adversity, moderate physical disabilities, or poor general health have an increased risk for an adverse outcome in the event of disaster.[2,6,15,19,22]

Finally, those individuals who receive injuries, who are witnesses to others' injuries, or who are involved in providing relief or health care in the event of disaster are at an increased risk for psychological morbidity.[12,13,35] With respect to health care workers exposed to disaster, serious psychiatric sequelae are related to education level, the types of injuries being treated, stressful life events in the postdisaster period, and emotional numbness immediately after the disaster.[13] In this regard, ongoing support for health care workers is an important consideration in disaster planning and response.

MANAGING TRAUMA IN SPECIAL POPULATIONS

Issues in Planning and Delivery of Mental Health Services

Activities such as hazard mapping and vulnerability and capacity analyses are critical aspects of effective disaster preparedness and response.[4,23] The intention of hazard mapping is to build disaster-resistant communities by identifying areas of not only geographic vulnerability but also social vulnerability. Thus, hazard mapping should be used to identify focal points that deserve particular attention following disasters. Essential community resources, such as schools, hospitals, places of worship, shelters, community halls, and local service groups, that are likely to be helpful in responding to a disaster should be well known. A community vulnerability inventory should be included to pinpoint local concentrations of at-risk groups,[4] which can then be used to direct services and resources to those with the greatest needs. Capacity analysis identifies those individuals and groups that are able to be mobilized in the event of a disaster, such as primary health care workers, community and social workers, nongovernmental organizations, and those with specific training in responding to disasters.

Disaster mitigation and response activities need to incorporate a gender strategy in order to take into account the unique vulnerabilities of women and children and to reflect the fact that women's and men's social roles can differentially affect the provision of relief services and recovery efforts.[23] Whereas men may typically be engaged in rescue, recovery, and redevelopment activities, women assume the nurturing role of putting lives back together, securing relief supplies and services, meeting the immediate survival needs of family members, and managing relocation when it is necessary.[8,23] However, cultural norms may inhibit or prevent women from accessing relief centers, interacting with male members of their communities who are not their kin, or assuming the status of household head in order to receive relief supplies. Women's safety and legal rights may be compromised in the postdisaster setting, and their time and labor in the provision of care to others may be taken for granted.[23] Whereas women are often portrayed as victims of disaster, their magnified responsibilities after the onset of disaster are largely ignored, with a consequent deficit in assistance to women through support networks and targeted resources.[8]

By incorporating gender issues and representing women's needs, views, and coping strategies into disaster planning and management, scarce resources can be more effectively focused. This planning may require the generation of sex-disaggregated data for community vulnerability and capacity assessments; identification of women who are marginalized and at risk, including impoverished women, women belonging to racial and ethnic minorities, those with chronic disabilities or health problems, women subject to domestic violence and abuse, and those forced to seek refuge in shelters in which security and privacy may be inadequate; and engagement of women as equal partners in community-based disaster mitigation, planning,[8] and psychosocial interventions.

Identification of at-risk groups may be facilitated using simple screening instruments designed to detect significant emotional stress. Short self-rated screening instruments for PTSD that may be adapted for easy use in the field include the Trauma Screening Questionnaire[36] and the SPAN.[37] Please also see Connor et al. in this supplement for an in-depth discussion. The particular screening method adopted should reflect that the most frequent psychiatric diagnoses are likely to be PTSD and depression. In this regard, Lima et al.[7] have reported that the narrow range of psychiatric disorders detected among victims of disaster makes it possible to circumscribe the training of the primary health care support worker in disaster mental health to these priority conditions. However, the wide range of other psychosocial problems that arise after a disaster should also be assessed. Narrow psychiatric screening may miss the more prevalent problems that people face. Focus group discussions, snowballing, and qualitative and active participation may be other ways to find out who may be affected. Identification of children who need mental health treatment may be complicated by dampened behavioral response or by decreased parental sensitivity to children's behavioral issues.[38]

Importantly, traumatized individuals are typically resistant to seeking treatment, so treatment must be taken to disaster victims within their affected communities.[12] Further, instead of concentrating on individual "treatment," it would be more prudent to use public mental health promotional activity as well as community approaches. Providing training and support to mental health workers already

in the affected communities is an effective method of reaching disaster victims.[39] Effective measures include educating community leaders in "psychological first aid," emotional support, information provision, and recognition of persons requiring primary health care referral; training grassroots and primary health care workers in basic mental health care knowledge and skills; and training community workers to assist primary health care workers with heavy case loads.[40]

Basic Principles in Disaster Management

Victims of disaster typically define their problems in terms of loss of loved ones, loss of home and income, and loss of communality, as well as the frightening experience they have been through.[41] In implementing psychosocial programs to address this loss, it is important that participants are encouraged to set goals for their participation, and any interventions should be aimed at helping people to recognize the options they still have rather than allowing them to focus only on their problems.

Health care providers need to be educated in terms of (1) understanding local idioms of distress and help-seeking behaviors; (2) identifying local mental health priorities; (3) understanding the effects of violence on individuals, families, and communities; (4) understanding the impact of structural violence, which often forms the context in which man-made disasters such as war have their greatest impact; and (5) familiarization with effective intervention strategies.

With regard to local idioms of distress, people of different cultures can be expected to express fear, psychological stress, and social problems in quite different ways. For example, in war-torn Cambodia and Sri Lanka, people presenting with psychological distress would often complain of headaches and breathing difficulty, respectively. This example demonstrates a need for health care workers to become educated in the expressions used by communities to communicate their distress. A person's cultural attachments may lead him or her to seek help from a traditional healer who, rather than recognizing psychological morbidity in terms of Western theories of causality, may instead view a person's problems in terms of his or her past conduct. This traditional help-seeking behavior and the resulting helping strategy need to be understood on a cultural basis and accommodated since more conventional methods of mental health intervention may not be viewed with the same acceptance. As Austin and Godleski[12] have pointed out, the most important ministrations to a disaster victim may not always be strictly medical. As in warfare, natural disaster may be of such magnitude that the damage extends beyond the individual or family level. The very fabric of society itself may be destroyed. This, in turn, causes the loss of coping mechanisms embedded in social ritual and experience, the very processes that help people find new meaning after disastrous events.

Although the biomedical model of therapy specifies the individual as the critical unit of analysis, factors in a disaster setting that are external to the individual may be relevant to his or her well-being. For example, in many third-world settings, attention may have to be paid to the family unit and its health functioning. The greatest good may in fact come from the progress of the community and its redevelopment and the psychosocial programs that are directed at a community level toward this end. Mental health professionals are, therefore, advised to put aside their particular methodological and philosophical biases and to focus on the rehabilitation of the community as a whole through the development of community-based interventions. Alternative approaches may include starting support groups for specific survivors, as well as more unorthodox approaches, such as "inventing" new rituals that help people come to terms with the specific traumatic events.[42]

Management Approaches for Special Groups

A variety of treatment approaches are required for both adult and child victims of trauma.[43] Techniques such as group therapy, cognitive and behavioral therapy, and desensitization and relaxation training can help victims of disaster enhance their coping skills and deal more effectively with life events. Group interventions have been found to be effective in promoting catharsis, support, and a sense of identification with others.[12] In particular, for women, groups, such as widows' groups, are very effective means of organizing individuals to support and help each other.

In the case of children, their resilience and recovery ability is dependent on basic human protective systems operating in their favor.[25] Psychosocial workers, teachers, health providers, and others may design, develop, and implement a variety of community-based psychological trauma interventions. These interventions allow those community members most affected by the trauma to play a central role in the resolution of, and community adaptation to, traumatic losses.[44] Children's caregivers should be encouraged to convey belief in, and empathy for, their children; provide a forum for discussion of their trauma; and promote coping skills. Beyond this level of intervention, school-based cognitive and behavioral therapy and specialized therapy for severely affected children are warranted.[27] In 1 study of children with disaster-related trauma symptoms,[45] both individual and group treatment provided by trained, school-based counselors were effective at reducing self-reported symptoms, although fewer children dropped out of group therapy.

Structured activity such as playing, drawing, singing, dancing, storytelling, and drama are very useful expressive methods for children as well as for traumatized adults and can be used in a group setting. Traditional relaxation methods such as word repetition (depending on the religion of the person: Hindu mantras, jappa; Catholic ro-

sary or prayer beads; Muslim "thikr"), breathing exercises (Buddhist ana pana sati; Hindu pranayama), and muscular relaxation (shanthi asana) are very powerful cultural techniques to deal with stress and effects of trauma that can be taught to individuals or groups.[46]

Although women tend to suffer disproportionately in every stage of a disaster, women's needs have yet to be adequately addressed in either disaster research or response.[4] Clearly, women stand to benefit from basic social interventions, such as efforts to establish physical safety; the ongoing dissemination of reliable information, particularly as it relates to relief activities; the reestablishment of contact with missing or absent relatives; and organization of nonintrusive support and outreach networks.[40] The woman as head of household and with the burden of responsibility for family members is a common disaster scenario. In many cases, the family home or primary means of shelter is destroyed and key material possessions lost, forcing the family to take refuge in a relief camp. Given this expanded emotional and material burden of many women in the early postdisaster period, therapeutic goals should begin with protecting survivors from excessive stimulation and premature responsibility for decision-making.[12] Assistance with childcare and the provision of essential items such as cooking utensils and clothing, together with adequate shelter and monetary support, may be all that are needed until the woman has had time to come to terms with her loss and is better equipped to deal with the consequences. Survivors should be offered information about the safety of relatives and given emotional support and the means to reestablish networks with family, friends, and other survivors, as well as providers of physical and psychological support.[12]

CHALLENGES IN PROVIDING MENTAL HEALTH CARE AFTER A DISASTER

Optimizing Use of Mental Health Resources

The postdisaster environment necessitates the urgent establishment of psychiatric services for those needing high-level care and the installment of community-based interventions to assist with basic support and screening. Within this environment, psychosocial and institutionalized interventions are interdependent; institutionalized programs cannot hope to reach every individual requiring a psychological intervention, and psychosocial work on its own is ineffective if there are no referral points to assist people with severe psychiatric symptoms.[39,47] As part of an integrated approach, the 2 types of interventions can produce better outcomes for a greater number of people.

Examples of this integrated approach include the establishment of mental health services in post–civil war Cambodia and the response to the Asian tsunami by Thailand. A community-based approach to mental health was adopted in Cambodia in which grassroots workers were trained so they would be able to address the most basic problems of mental health in rural villages.[39] A referral system to centralized, institutionalized care was established for more serious psychiatric disorders, which was suitably adapted to enable stabilized patients to be referred back to the community for follow-up and support. After the Asian tsunami, the Thai Ministry of Health immediately planned the establishment of a temporary psychiatric clinic in the vicinity of Khao Lak in Phong Nga, one of the hardest hit areas. Subsequently, a large number of Buddhist monks recruited under the "Monks for Moral Recovery" project banner were sent to tsunami-affected areas to assist the local population in dealing with their trauma. The monks in this instance provided a basic counseling service while identifying potential candidates for more formal psychiatric interventions, thereby freeing up clinic resources for only the most needy cases.

Barriers to Effective Recovery

The sociocultural context in which mental health care is provided is an important consideration in the disaster setting, since social and cultural differences may act as barriers to successful outcome. The approach taken by the Ministry of Health in conjunction with Buddhist monks to provide mental health care for tsunami victims in Thailand needed to be sensitive to the local context, since the use of Buddhist monks in Muslim areas of the community, as an example, had the potential to be met with local resistance and thereby act as a barrier to intervention. Given that ethnic minorities may be at increased vulnerability and that culture may influence access to and delivery of mental health care services, ethnicity, culture, and religion, as well as class and caste need to be considered in any service delivery program.[11,23]

Since disaster planning, management, impact, response, and even research are largely social processes, and as such have evolved over a long history of culturally embedded patriarchy, it is important to deconstruct these processes "through the eyes of women" in order to be able to deliver mental health services that are sensitive to their needs.[4,23] Cultural norms that may inhibit women from accessing relief centers, prevent them from leaving home due to childcare responsibilities, prevent them from interacting with male members of their community, or contribute to their social isolation and alienation need to be recognized and a solution provided.[5,23] Disaster mental health programs can be implemented in such a way that they ameliorate barriers that contribute to gender and ethnic disparities in their use by giving greater attention to socially engaged emotions and functioning (many concrete examples may be found in the *World Disasters Report 2001* of the International Federation of Red Cross and Red Crescent Societies).[48] Health care providers should be encouraged to (1) assess community needs early and often, (2) provide easily accessible services, (3) work collaboratively and proactively to reduce

stigma and mistrust and engage minorities in care, (4) ensure a sizable representation of women among health care workers (i.e., health care providers should encourage women to apply for positions and then select them for training), (5) validate and normalize distress and help-seeking behaviors, (6) value interdependence as well as independence as a developmental goal, (7) promote community action, and (8) advocate for treatment and evaluation research.[11] Collaborations with traditional healers should be particularly encouraged, since a working alliance between traditional and allopathic practitioners may help to break down barriers to treatment acceptance and delivery.[40]

Redevelopment of the postdisaster environment may be associated with new hazards, which are accepted by society as a whole due to the perceived benefits, but whose disadvantages or risks are disproportionately realized by special populations.[4,10] Examples include urban development leading to an influx of low socioeconomic groups with resulting settlement on marginal land or in high-density, poor-quality housing; coastal development with potential exposure to extreme weather conditions; displacement of fishermen and the landless poor from coastal belts ostensibly for their protection while corporate business and the state take over for tourist and other industries, such as happened after the recent tsunami; forestry projects with consequent destabilization of surrounding land; investment in poorly controlled, hazardous industries; and agricultural projects aimed at promoting cash crops with loss of production of staple foods.[10] Therefore, the community should be consulted at all levels during recovery and reconstruction, ensuring that women's views and the views of other special populations are considered and that the special groups themselves are actively engaged with relevant responsibilities in the redevelopment process. Training and education are of critical importance in preventing increased vulnerability as a result of development strategies that continue to marginalize special populations from available resources.

A COMMUNITY-BASED MODEL FOR INTERVENTION

In developing countries, the high prevalence of mental disorders and psychosocial problems among disaster victims far exceeds specialized mental health care resources.[7] Therefore, the general health sector, particularly at the primary care level, must actively participate in the delivery of services to meet the needs of disaster victims. Psychoeducation campaigns are invaluable in identifying vulnerable groups and will further assist in the tailor-made design of psychosocial, community-based interventions to complement psychiatric services.

Psychoeducation

Psychoeducation campaigns are designed to introduce a basic level of mental health knowledge at different levels within the community. This can be achieved using a mass media approach (e.g., radio, television, newspapers); a more targeted approach involving pamphlets and newsletters for primary health care workers, teachers, and community workers; or a more personal approach such as delivering seminars and workshops for the different groups within a community. In the disaster setting, psychoeducation programs are a means of supporting trauma survivors without impeding their natural recovery by providing accurate information about normal responses and ways to cope.[49] These programs can also be used to assist community workers in screening for at-risk individuals who would benefit from ongoing support. Moreover, by helping to normalize trauma responses, psychoeducation is an important instrument for reducing any stigma associated with seeking this type of support. An effective way of delivering psychoeducation is ostensibly through other support services, thereby attracting a potentially larger number of participants.

Psychosocial Support

A key aspect of providing psychosocial interventions intended to mitigate the impact of disaster is training of key personnel who will provide counseling, encouragement, motivation, and support for others. Ideally, these personnel would be drawn from all available human resources, such as primary health care workers, teachers, religious leaders, and traditional healers. While operating in a flexible manner to best represent the needs of different community groups, psychosocial workers and service providers should aim to network with all other organizations in the field in order to optimize outcomes. Counseling alone will be insufficient for those people with severe psychological symptoms. Therefore, effective treatment requires an integrative approach with referral to mental health professionals for more severe problems.

Training of grassroots community workers in basic mental health knowledge and skills is the easiest way to reach a large population. In conjunction with their primary role of providing psychosocial support, these workers increase the general awareness of mental health issues, disseminate knowledge, undertake promotional and psychoeducational programs, and contribute to the prevention of serious psychiatric sequelae (Table 1). The majority of minor mental health problems can be managed within the community, with more serious cases referred elsewhere.

To reestablish the mental health infrastructure in Cambodia after decades of civil war, a primary care approach similar to the one advocated here has been adopted.[39] Among the grassroots workers trained in a psychosocial capacity have been government ministry staff, nongovern-

Table 1. Community-Based Approaches to Providing Psychosocial Care

Approach
Awareness
Training of community workers
Promoting public mental health activities
Encouraging indigenous coping strategies
Cultural rituals and ceremonies
Community interventions
Family
Groups
Expressive methods
Rehabilitation
Prevention

mental organizations, provincial and district hospital and health clinic primary care staff, village health volunteers, members of village development committees, monks, nuns, teachers, village elders, and traditional birth attendants. Psychosocial interventions that have been effective in this setting include self-help groups for women who have lost husbands, traditional Buddhist relaxation methods, and meditation. Those individuals requiring more intensive support and pharmacologic interventions were referred for specialist psychiatric care.

From an allopathic perspective, cognitive-behavioral approaches to the treatment of trauma-related symptoms are known to be effective in children exposed to various traumatic events, with better outcomes associated with the inclusion of children's caregivers in offering these treatments.[27] However, group therapy also has been shown to be effective,[45] and the use of traditional relaxation methods in group settings such as schools is likely to bring benefits to children affected by disaster.[39] Counselors should be encouraged to utilize children's energies in a creative way, by engaging them in structured activities relevant to a particular age group and thereby allowing them to express their emotions. Teachers are an important resource to assist with the well-being of children but for reasons already discussed should provide ongoing curriculum-based learning for children and adolescents. At a planning level, psychosocial training for teachers should be ongoing.

Finally, when a community caught up in disaster is actively engaged at all levels in the provision of interventions aimed at promoting the well-being of its inhabitants, there is often a resulting sense of communality that is like gold pavers on the long road to recovery. The local community becomes empowered to define solutions for its current crisis and for any problems ahead. Such communities are capable of disseminating knowledge and support to a wider population.

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling has been presented in this article.

REFERENCES

1. Sapir DG. Natural and man-made disasters: the vulnerability of women-headed households and children without families. World Health Stat Q 1993;46:227–233
2. Norris FH, Friedman MJ, Watson PJ, et al. 60,000 disaster victims speak, pt 1: an empirical review of the empirical literature, 1981–2001. Psychiatry 2002;65:207–239
3. Wang X, Gao L, Zhang H, et al. Post-earthquake quality of life and psychological well-being: longitudinal evaluation in a rural community sample in northern China. Psychiatry Clin Neurosci 2000;54:427–433
4. Morrow BH. Identifying and mapping community vulnerability. Disasters 1999;23:1–18
5. Hutton D, Haque CE. Human vulnerability, dislocation and resettlement: adaptation processes of river-bank erosion-induced displacees in Bangladesh. Disasters 2004;28:41–62
6. Chou YJ, Huang N, Lee CH, et al. Who is at risk of death in an earthquake? Am J Epidemiol 2004;160:688–695
7. Lima BR, Pai S, Santacruz H, et al. Psychiatric disorders among poor victims following a major disaster: Armero, Colombia. J Nerv Ment Dis 1991;179:420–427
8. World Health Organization. Gender and women's health: gender and disaster. 2005. Available at: http://w3.whosea.org/en/Section13/Section390_8282.htm. Accessed June 2, 2005
9. Meyers M. "Women and children first": introducing a gender strategy into disaster preparedness. Focus Gend 1994;2:14–16
10. Stephenson RS, DuFrane C. Disasters and development, pt 2: understanding and exploiting disaster-development linkages. Prehospital Disaster Med 2002;17:170–174
11. Norris FH, Alegria M. Mental health care for ethnic minority individuals and communities in the aftermath of disasters and mass violence. CNS Spectr 2005;10:132–140
12. Austin LS, Godleski LS. Therapeutic approaches for survivors of disaster. Psychiatr Clin North Am 1999;22:897–910
13. Epstein RS, Fullerton CS, Ursano RJ. Posttraumatic stress disorder following an air disaster: a prospective study. Am J Psychiatry 1998;155:934–938
14. North CS, Nixon SJ, Shariat S, et al. Psychiatric disorders among survivors of the Oklahoma City bombing. JAMA 1999;282:755–762
15. Basoglu M, Salcioglu E, Livanou M. Traumatic stress responses in earthquake survivors in Turkey. J Trauma Stress 2002;15:269–276
16. Kessler RC, Sonnega A, Bromet E, et al. Posttraumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 1995;52:1048–1060
17. Breslau N, Davis GC, Andreski P, et al. Sex differences in posttraumatic stress disorder. Arch Gen Psychiatry 1997;54:1044–1048
18. Perkonigg A, Kessler RC, Storz S, et al. Traumatic events and post-traumatic stress disorder in the community: prevalence, risk factors and comorbidity. Acta Psychiatr Scand 2000;101:46–59
19. Guarnaccia PJ, Canino G, Rubio-Stipec M, et al. The prevalence of ataques de nervios in the Puerto Rico disaster study: the role of culture in psychiatric epidemiology. J Nerv Ment Dis 1993;181:157–165
20. Armenian HK, Morikawa M, Melkonian AK, et al. Risk factors for depression in the survivors of the 1988 earthquake in Armenia. J Urban Health 2002;79:373–382
21. Kuo CJ, Tang HS, Tsay CJ, et al. Prevalence of psychiatric disorders among bereaved survivors of a disastrous earthquake in Taiwan. Psychiatr Serv 2003;54:249–251
22. Brewin CR, Andrews B, Valentine JD. Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. J Consult Clin Psychol 2000;68:748–766
23. World Health Organization. Gender and health in disasters. 2002. Available at: http://whqlibdoc.who.int/gender/2002/a85575.pdf. Accessed June 2, 2005
24. World Health Organization. Gender considerations in disaster assessment. 2005. Available at: http://www.who.int/gender/other_health/en/gwhdisasterassessment.pdf. Accessed June 2, 2005
25. Caffo E, Belaise C. Psychological aspects of traumatic injury in children and adolescents. Child Adolesc Psychiatr Clin N Am 2003;12:493–535
26. Newman CJ. Disaster at Buffalo Creek, children of disaster: clinical observations at Buffalo Creek. Am J Psychiatry 1976;133:306–312
27. Brown EJ. Clinical characteristics and efficacious treatment of posttraumatic stress disorder in children and adolescents. Pediatr Ann

2005;34:138–146
28. Somasundaram D. Psychiatric sequelae to a chronic civil war. In: Scarred Minds: the Psychological Impact of War on Sri Lankan Tamils. New Delhi, India: Sage Publications; 1998:174–220
29. Epidemiological survey of children's mental health in the Vanni region. In: VIVO (Victims' Voice). Colombo, Sri Lanka: German Technical Cooperation; 2003
30. Mental Health Task Force In Disaster, Jaffna District. Qualitative Assessment of Psychosocial Issues Following the Tsunami. Available at: http://www.who.int/hac/events/tsunamiconf/presentations/2_14_non_governmental_actors_canagarathnam_doc.pdf. Accessed June 2, 2005
31. Fernandez LS, Byard D, Lin CC, et al. Frail elderly as disaster victims: emergency management strategies. Prehospital Disaster Med 2002;17:67–74
32. Chung MC, Werrett J, Easthope Y, et al. Coping with post-traumatic stress: young, middle-aged and elderly comparisons. Int J Geriatr Psychiatry 2004;19:333–343
33. Phifer JF. Psychological distress and somatic symptoms after natural disaster: differential vulnerability among older adults. Psychol Aging 1990;5:412–420
34. Thompson MP, Norris FH, Hanacek B. Age differences in the psychological consequences of Hurricane Hugo. Psychol Aging 1993;8:606–616
35. Wood DP, Cowan ML. Crisis intervention following disasters: are we doing enough? (A second look). Am J Emerg Med 1991;9:598–602
36. Brewin CR, Rose S, Andrews B, et al. Brief screening instrument for post-traumatic stress disorder. Br J Psychiatry 2002;181:158–162
37. Meltzer-Brody S, Churchill E, Davidson JR. Derivation of the SPAN, a brief diagnostic screening test for post-traumatic stress disorder. Psychiatry Res 1999;88:63–70
38. Stuber J, Galea S, Pfefferbaum B, et al. Behavior problems in New York City's children after the September 11, 2001, terrorist attacks. Am J Orthopsychiatry 2005;75:190–200
39. Somasundaram DJ, van de Put W. Putting mental health in perspective. Bull World Health Organ 1999;77:275–277
40. World Health Organization. Mental health in emergencies. 2003. Available at: http://www.wpro.who.int/NR/rdonlyres/6312A18D-1B1C-4F03-928C-394E24D9A7E6/0/MentalHealthinEmergencies.pdf. Accessed June 2, 2005
41. de Jong JTVM. Public mental health, traumatic stress and human rights violations in low-income countries: a culturally appropriate model in times of conflict, disaster and peace. In: de Jong JTVM, ed. War, Trauma and Violence: Public Mental Health in Socio-Cultural Context. New York, NY: Plenum Press; 2002:1–93
42. van de Put WACM, Eisenbruch M. Internally displaced Cambodians: healing trauma in communities. In: Miller K, Rasco L, eds. The Mental Health of Refugees: Ecological Approaches to Healing and Adaptation. Mahwah, NJ: Lawrence Erlbaum Associates, Inc; 2004:133–159
43. Hosin AA. Children of traumatized and exiled refugee families: resilience and vulnerability: a case study report. Med Confl Surviv 2001;17:137–145
44. Macy RD, Behar L, Paulson R, et al. Community-based, acute posttraumatic stress management: a description and evaluation of a psychosocial-intervention continuum. Harv Rev Psychiatry 2004;12:217–228
45. Chemtob CM, Nakashima JP, Hamada RS. Psychosocial intervention for postdisaster trauma symptoms in elementary school children: a controlled community field study. Arch Pediatr Adolesc Med 2002;156:211–216
46. Somasundaram DJ. Using traditional relaxation techniques in minor mental health disorders. Int Medical J 2002;9:191–198
47. Somasundaram DJ, van de Put WA, Eisenbruch M, et al. Starting mental health services in Cambodia. Soc Sci Med 1999;48:1029–1046
48. The International Federation of Red Cross and Red Crescent Societies. World Disasters Report 2001. Geneva, Switzerland: The International Federation of Red Cross and Red Crescent Societies; 2001
49. Howard JM, Goelitz A. Psychoeducation as a response to community disaster. Brief Treat Crisis Interven 2004;4:1–10

Cultural Sensitivity: Making Trauma Assessment and Treatment Plans Culturally Relevant

Richard A. Bryant, Ph.D., and Frank G. Njenga, F.R.C.Psych.

The Asian tsunami on December 26, 2004, has had a profound impact on the mental health of large numbers of people in several South Asian nations. Many psychological interventions with relevance to this disaster have been shown to be effective in a Western context. For these psychological interventions to prove effective in the tsunami-affected regions, they must be understood and accepted by health-care practitioners and patients in their individual cultural settings and must be adapted to these settings on the basis of careful dialogue between health-care professionals, community and religious leaders, and patients. Religious, socioeconomic, and other cultural influences all affect the acceptability and success of various psychological assessment and treatment tools. The cultural specificity of these tools needs careful validation in the tsunami-affected countries. The challenge in each local situation is to find the optimal means of adapting tools such as cognitive-behavioral therapy into appropriate strategies for local communities. We advocate a culturally sensitive approach to ensure that the impact of interventions is optimized to benefit the communities recovering from such a traumatic disaster.
(J Clin Psychiatry 2006;67[suppl 2]:74–79)

Standard mental health approaches require sensitive adaptation in order to be effective in a particular culture. South Asian countries bore the brunt of the tsunami disaster, and the many groups of people represented in these regions will need a culturally sensitive approach to ensure that available therapies such as cognitive-behavioral therapy (CBT), developed from a Western mind-set and validated within a Western culture, are both accepted and effective in an Eastern context. Some studies show that therapeutic programs are able to cross cultural boundaries, and there is evidence that responses to disaster such as posttraumatic stress disorder (PTSD) are experienced similarly in people of different cultures.[1,2] However, other studies highlight the limitations of such models and suggest that social, cultural, and political influences are embedded into interventions, therefore making these interventions difficult to use in different settings.[3,4] Some researchers have suggested that, in some cultures, what is described in the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV), as pathology may in fact be a normal response to trauma that needs no professional support.[5] This view holds that it is presumptuous to extrapolate from Western conceptualizations to cultures that are based on very different epistemologies and that often view well-being in terms of social cohesion rather than one's personal state.[6] Further, some commentators point to the risk of generalizing from endorsement of Western-defined symptoms to dysfunction because individuals from many cultures may experience apparently adverse psychological states but continue to function at a high level.[7]

Cultural expectations and assumptions play an important, but perhaps hidden, role in the design of mental health interventions. Issues such as family structure, gender roles, time orientation, and social and occupational commitments have often been overlooked by health-care professionals and may result in the failure of tools previously well accepted in other cultures.[8] Interventions can be received differently according to one's cultural or religious perspective. It is therefore worth taking the time and effort to understand the culture in which interventions are applied and encourage cross-cultural dialogue to allow their sensitive adaptation and so ensure acceptability and success. Current assessment and treatment approaches for PTSD and related comorbid conditions such as depression, anxiety, and grief need to be culturally relevant and appropriate for these cultures.

The tsunami primarily affected people within a South Asian culture. In general, this culture tends to be rather re-

From the School of Psychology, University of New South Wales, Sydney, New South Wales, Australia (Dr. Bryant); and the Department of Psychiatry, Upper Hill Medical Centre, Nairobi, Kenya (Dr. Njenga).

Presented at the symposium "After the Tsunami: Mental Health Challenges to the Community for Today and Tomorrow," which was held February 2–3, 2005, in Bangkok, Thailand, and supported by an educational grant from Pfizer Inc.

This review was supported by grant #300304 from the National Health and Medical Research Council Program (Australia).

Corresponding author: Richard A. Bryant, Ph.D., School of Psychology, University of New South Wales, Sydney, NSW 2052, Australia (e-mail: r.bryant@unsw.edu.au).

served and may be unwilling to display emotional distress, especially with regard to grief and guilt. The extended family is the basic institution and plays a far more important role than the "nuclear" family seen in the West. The village is a fundamental unit of many Asian societies, and, despite inexorable urban migration, ties to one's original birthplace, family, and clan remain strong. In that part of the world, an individual's identity is associated strongly with the home village and surrounding community.

Religious faith is another fundamental influence in this region and, in turn, has a significant impact on people's response to such a traumatic experience. Hinduism, Buddhism, Islam, Christianity, and animist/folk religions are central to the life and culture of South Asian people and influence both the initial response to a traumatic event and later response to therapy and rehabilitation. In addition, the practice and underlying philosophy of traditional medicine in many South Asian countries is inextricably linked to religion and culture. Traditional practices may provide a significant barrier to the effective introduction of contemporary mental health interventions if the value of the new intervention is not clearly explained and understood, particularly if the intervention is viewed as a challenge to current beliefs.

Another important cultural factor is the mental health system existing in the specific region affected by the tsunami. Many of the affected regions possess mental health systems that are very different from the settings in which established Western treatments were developed. For example, CBT evolved in settings characterized by individual face-to-face therapy, well-resourced mental health systems, and a tradition of help-seeking for mental health problems. It needs to be recognized that adapting Western treatments to Asian contexts may involve obstacles arising from cultural differences in how mental health is conceptualized and how mental health services are regarded.

SCREENING AND ASSESSMENT TOOLS FOR PTSD

A number of groups are particularly vulnerable to PTSD and demand special attention with an appropriate cultural approach. In the case of the tsunami, as with other large-scale disasters, whole communities are affected and therefore screening and assessment need to adopt a community-based approach. When resources are limited, it is particularly important to identify those people most at risk and those who will benefit most from treatment.

Immediately after the tsunami, children in the relief camps in both Thailand and Sri Lanka were reportedly responding well and perhaps did not fully appreciate the catastrophic events that had taken place. However, a survey in a Sri Lankan camp 3 weeks after the disaster showed that 41% of the children (aged 7–15 years) had evidence of severe acute stress disorder (3 weeks after trauma) identified by use of the Validated Short Screening Questionnaire.[9] The PTSD Checklist (PCL), a 17-item self-report checklist of PTSD symptoms[10] based closely on the DSM-IV criteria, has now been validated for the Tamil community, who make up a significant proportion of the Sri Lankan population and were a group severely affected by the tsunami in south India.[9]

Adolescents are a newly identified vulnerable group who experience grief and aggression and who may develop delayed antisocial behavior in response to traumatic events. Behavioral problems previously associated by parents and other adults with being "naughty" may be linked with mental health problems. Traumatized adolescent boys in Sri Lanka showed signs of hostility and other antisocial behaviors following the tsunami that could prove problematic to society. Although posttraumatic symptoms in this age group have been shown to be similar across some cultures,[11] it is possible that the nature and treatment needs of adolescents in Asian cultures may be different from those of adolescents from the West.

Single parents are another at-risk group with particular needs. Many men who lost their wives in the tsunami have been faced for the first time with looking after young children and other domestic tasks normally reserved for women in these cultures. These men may be prone to depression and alcohol abuse. Likewise, bereaved women are faced with a new role as head of the household for the first time and may find the balance of finding suitable work and caring for the family impossible to achieve, with a resulting harmful effect on income and well-being. The problems faced by single-parent families are particularly likely in families in which, even though no parent died in the tsunami, parents are required to leave the family home because of lack of employment. For example, in southern Thailand, many major hotels are not being rebuilt after the tsunami, which will result in long-term unemployment for many people. As a consequence, many parents might move to Bangkok to seek work to support their families who remain in the south of Thailand. Such economic realities may have long-lasting mental health consequences.

Screening for PTSD in a post-disaster situation, such as that following the tsunami, is useful only if it is followed up with action. Wide-scale screening of people who report mental health problems is indicated if there are sufficient resources to meet the needs of those identified in the screening procedure. The identification of people who require treatment when one cannot treat them poses new problems and thus should be avoided. This is particularly likely to be the case in the acute phase after a disaster, such as the tsunami, because the social and organizational chaos that often occurs after a massive disaster precludes mental health interventions being available for the massive demand that is observed. In this sense, it is probably sensible to delay screening of people

Table 1. Screening and Assessment Tools Validated in Different Cultures and Languages

The 12-item General Health Questionnaire (GHQ-12)–revised[13]
Davidson Trauma Scale (DTS)[14]
Posttraumatic Stress Disorder Diagnostic Scale (PTSDDS) and other measures of anxiety and related disorders[15]
Harvard Trauma Questionnaire (HTQ)[16,17]
Hopkins Symptom Checklist-25 (SCL-25)[16]
Startle, Physiological arousal, Anger, and Numbness (SPAN)[18]

who require treatment until requisite resources are available to provide treatment (see Bryant, "Recovery," this supplement).

The DSM-IV marked a dramatically new level of acknowledgment of the role of culture in shaping the symptoms, expression, and course of major mental illness.[12] These criteria highlight that clinicians who understand the influence of culture will be sensitive to the needs of patients with PTSD and will ensure that any treatment they receive does not isolate them from family and community, which is vital in the tsunami-affected region. Because most people will recover from the immediate effects of the traumatic event, the measurement of resilience is very important. As described elsewhere in this supplement (see Connor, "Assessment," this supplement), screening for resilience may be an effective measure of treatment outcome. In addition, longer-term screening may be important for the management of PTSD, grief, and depression in affected populations because the development of disorders is nonlinear and may extend to many months after the event. There are screening/assessment tools that have now been tested and validated in different cultures and/or languages (Table 1).[13–18]

TREATMENT APPROACHES FOR PTSD

A number of key stages are central to an effective treatment approach in every culture after a traumatic event. These include normalization, death/grief rituals, community support, and close monitoring. For example, in the early days after a major traumatic event, efforts should be directed not toward early psychological intervention but toward social support and the strengthening of individual and community resources. Any intervention must aim to restore stability and control and not interfere with the natural recovery processes. For example, bereaved or traumatized children should not be moved from their community, and people are best not displaced to refugee camps distant from their homes. In this way, normal recovery can take place in a community/family setting. In such situations, detailed assessment will be required as people go through the different stages of recovery (see the beginning of this paragraph). In apparent contravention of the commitment to culture sensitivity, many Western agencies sent counselors to tsunami-affected areas very soon after the event to perform psychological debriefing for people feared to be at risk of developing PTSD. Apart from the lack of evidence to support this approach in Western settings, this intervention typically neglects the local cultural needs that underpin recovery in many Asian contexts.

Any psychological treatment approaches need to be complementary to religious/cultural/traditional rituals that are already in place within that community. Much work is needed to transfer a treatment plan between different geographic regions, bearing in mind that the economic, political, and historical context may be as important as the cultural context. It should be remembered that Western medical culture changes rapidly, whereas South Asian cultures have a long history of traditional medicine, a fact that might impede the acceptance of new ideas foreign to that culture. A sensitive combination of local and other approaches will optimize response to the crisis. Teamwork and dialogue between health-care professionals and local leaders are vital to the overall success of any mental health strategy. Community and religious leaders have a crucial role to play in explaining to the local community what has happened and the need for a positive response, while widely accepted psychological tools can relieve symptoms of the crisis, thereby aiding recovery and rehabilitation.

Delivering PTSD Therapy in Western and Asian Countries

In Western culture, most PTSD therapy has been managed on a one-to-one basis. There are limited data for community therapy other than analyses of Vietnam veterans, who represent a discrete treatment group, and even fewer for frontline, nonselective clinical settings encompassing a whole community.[19] For large populations affected by a disaster, group therapy would seem to be the best practical approach.

In Asian countries, group therapy is the most natural approach, so any intervention based on an individual approach must always be put into the context of family and community structure, culture, religion, and socioeconomics.[20,21] After the U.S. Embassy bombing in Nairobi, group-based interventions were apparently used with good effect. Mental health programs need to be initiated at the community level, and local resources should be considered initially before imposing an external framework on any intervention. In the case of the tsunami in South Asia, the very scale of the disaster demanded a community approach—approximately 50% of the affected population was estimated to be suffering from PTSD, with 10% requiring intervention.[22]

The tsunami profoundly affected the structure of many families throughout the affected areas. Reuniting families in this culture and reestablishing normal patterns of life have been seen as paramount for long-term recovery. In the same way, any psychological intervention should be designed primarily to ensure the restoration of families

and then allow healing and rehabilitation to occur within the restored family unit. The tsunami, like any other large-scale disaster, produced a so-called loss of communality. The early restoration of normal community and village social structures is vital to healthy regeneration, particularly in the tight-knit fishing communities impacted by the tsunami. Frequent deterioration of moral values that has been observed in refugee/displaced persons camps has been linked with destructive sexual behavior and excess alcohol consumption, which cause further distress within the community.

Culturally Sensitive Treatment Strategies for PTSD

Cognitive-behavioral therapy is the best psychosocial approach in treating PTSD, anxiety, depression, and grief, as numerous controlled studies and practice guidelines around the world have shown. Cognitive-behavioral therapy is discussed elsewhere in this supplement (see Bryant, "Recovery," and Foa, "Psychosocial Therapy," in this supplement). However, any intervention needs to match cultural norms, and there are some culturally sensitive approaches that will optimize the effectiveness of this approach. Cognitive-behavioral therapy has not been tested rigorously in the countries affected by the tsunami, and close dialogue is needed to ensure that the proven effective components of CBT are introduced to these situations in a culturally acceptable way. In these conditions, the timing of treatment initiation should not be based on a specified number of weeks after the event but more on the resources available and strength of the surrounding infrastructure. Fulfillment of basic needs (food, water, shelter, and sanitation), rehabilitation of injured individuals, rebuilding of homes, and location of loved ones should take priority over initiating CBT.

It is important that CBT is viewed not as an imported Western approach that can be applied successfully in an Eastern context. Rather, it should be viewed as a proven approach in Western and some non-Western situations that requires cultural adaptation to work best in a local situation. A creative, flexible approach is needed to ensure its optimal use, while at the same time rigorous research should be carried out on its impact.

Grief is experienced in many different ways in different cultures, perhaps with far greater variation than PTSD. In the case of the tsunami, it is likely that grief reactions will develop slowly and will compound PTSD. This grieving process needs time to develop before CBT can be used. In addition, grief is a highly culturally specific response, and rituals must not be interfered with since they are important strategies for coping with grief. Interventions for complex grief must be based on intensive dialogue to ensure the applicability for each cultural situation.

Cognitive-behavioral therapy will work well in different cultures if it is related contextually. In the South Asian context, prayer, meditation, tai chi chuan, ayurvedic massage, and other traditional relaxation methods could be useful vehicles to deliver CBT. Cognitive-behavioral therapy has already been successfully adapted to a South Vietnamese population[23] and, in combination with pharmacotherapy, has been shown to achieve substantial gains in Khmer-speaking Cambodian refugees.[24] Cognitive-behavioral therapy has been recently adapted, with impressive results, in a randomized trial of Sudanese refugees living in a Ugandan refugee settlement who suffered from PTSD secondary to considerable trauma. This trial compared narrative exposure therapy (a variant of CBT), supportive counseling, and education; all therapy was administered through interpreters. This trial indicated that only 29% of participants receiving the exposure therapy still had PTSD 1 year after treatment, compared with 80% of those receiving education or counseling.[25]

Four key issues need to be addressed in order to optimize the delivery of CBT and other therapies: training of local primary care physicians, adaptation of CBT (or other therapy) to group therapy, assimilation with local religious and community customs, and rigorous evaluation of the adapted therapy. Local primary health-care physicians operating within their specific cultural environment need to be trained in the diagnosis and treatment of mental health conditions, including how to deliver CBT and pharmacotherapy effectively (see Davidson, "Pharmacologic Treatment," this supplement). Although certain psychological techniques have been proved to be effective, they will be less effective if they are portrayed in ways that are unacceptable and not understandable for practitioners on the ground to use them as part of their regular treatment options.

The DSM-IV guidelines acknowledge the important role of ethnicity in response to pharmacologic treatment, and physicians should be aware of their local situation. These local doctors, and other health-care workers, will be the first in line in confronting mental health issues in a devastated community after a disaster as enormous and widespread as the tsunami. It is worth remembering that the trajectory of recovery following the tsunami may be different from other traumas because of community devastation, widespread grief, and ongoing problems associated with the event. Many health workers were themselves either killed or traumatized and in need of care.

Education and understanding play a vital role in the effective delivery of CBT. If patients and therapists do not understand why they are involved in CBT or pharmacotherapy, there will be limited motivation to persevere with therapy, particularly when there are challenging times in the normal course of the treatment. Cognitive-behavioral therapy is a complex and challenging therapy for practitioners to apply well; therefore, its rationale and application need to be culturally acceptable and relevant.

The tsunami has left tens of thousands of people with mental health issues, and individual therapy is not

a practical option in this situation. Group therapy has a higher patient:counselor ratio, which improves cost-effectiveness. It is essential that the health-care workers create a "safe" environment in which the group therapy may take place. Any therapy should be prepared with local help and should resonate with the traditional village or community structure.

Normal community approaches to disaster, such as burial rituals, anniversaries, and other religious ceremonies, are very important for helping people to rehabilitate and should be encouraged. In introducing CBT, it may be important to stress that its objective is not to change people's beliefs but to help people think in a different way about their experiences, themselves, and their future so they will have a chance of earlier recovery. The impact of local beliefs is important to consider when developing an effective treatment approach.[26] Greater religious faith before a trauma has been shown to reduce subsequent development of PTSD. After trauma, the support gained through personal and community belief structures also reduces the incidence of PTSD.[27]

Local religious and community support structures are also invaluable. For instance, monks have been central to the recovery and rehabilitation process in predominantly Buddhist countries. There is considerable scope to integrate Buddhist teachings into CBT. Take, for example, the considerable overlap between Buddhist teaching and cognitive restructuring. Many Buddhists coped with the effects of the tsunami by recognizing that, according to Buddhist philosophy, nothing remains the same, and the devastation caused by the tsunami is part of the ever-changing nature of our world. Further, CBT has recently embraced Buddhist techniques in the form of mindfulness therapy, which adapts cognitive restructuring by teaching patients strategies to observe and distance themselves from cognitions that are maladaptive.[28] It should also be noted, however, that trauma-exposed individuals can make maladaptive appraisals based on Buddhist beliefs. For example, after the tsunami some people blamed themselves for the loss of family members because they concluded the deaths were a result of karma caused by their flaws in a previous life. These responses highlight the need to create a dialogue between CBT and Buddhist approaches (as well as those of other religious ideologies) to ensure that people can optimally benefit from their personal belief systems.

In vivo exposure is one of the most potent and easily used tools in treating PTSD and is particularly important in treating phobic or avoidant behaviors. The approach typically involves graded exposure to feared situations so that the patient can gradually learn to face feared situations in a safe way. Following the tsunami, there may be many fishermen who will be fearful of their only source of income provision. They need to be encouraged through exposure to resolve avoidant behaviors. This approach must be performed in a culturally sensitive way so as not to bring a sense of shame or weakness on the patient. Exposure also needs to be structured in a way that does not expose people to excessive anxiety. For example, during certain months when the seas are choppy, it may be unwise to ask fishermen to approach the sea because the high seas may impede gradual exposure to feared stimuli.

SUMMARY AND CONCLUSIONS

The cultural specificity of assessment and treatment tools needs careful validation in the tsunami-affected countries. The challenge in each local situation is to find the optimal means of adapting CBT into appropriate strategies for local communities. As time goes on, there will be a need to share resources between countries in the same region to optimize screening and treatment approaches. There also needs to be a mechanism by which regular progress updates can be communicated to refine and adapt mental health strategies in these affected communities.

Each disaster is a unique event. Although helpful experience can be gained from analyzing an earlier disaster, superimposing one disaster situation on another as far as recovery experiences are concerned can lead to inevitable difficulties. Accordingly, physicians must be prepared for different responses and develop a flexible and creative approach to any new disaster.

Physicians cannot be prescriptive about the therapies for PTSD in the tsunami-affected countries. A significant challenge is to improve dialogue to allow those successful ingredients of CBT to be adapted to make them work in different cultures. Despite the magnitude of the tsunami disaster, it has provided perhaps the first opportunity to evaluate how to customize mental health strategies developed under controlled conditions to the treatment of large numbers of people in diverse cultures. It is essential that treatments that have been proven in the West are initially adapted with local cultural considerations. The next step is to subject these adapted interventions to controlled studies that evaluate the effectiveness of the interventions. These trials should focus on both the capacity of the intervention to reduce symptoms and the willingness of practitioners to embrace the intervention. It is imperative that these trials be conducted, because one cannot assume that even culturally adapted interventions are effective if they are not subjected to rigorous evaluation.

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling has been presented in this article.

REFERENCES

1. Sack WH, Clarke G, Him C, et al. A 6-year follow-up study of Cambodian refugee adolescents traumatized as children. J Am Acad Child Adolesc Psychiatry 1993;32:431–437

2. Goenjian AK, Karayan I, Pynoos RS, et al. Outcome of psychotherapy among early adolescents after trauma. Am J Psychiatry 1997;154: 536–542
3. Bracken PJ, Giller JE, Summerfield D. Psychological responses to war and atrocity: the limitations of current concepts. Soc Sci Med 1995;40: 1073–1082
4. Rousseau C, Drapeau A, Platt R. Family trauma and its association with emotional and behavioral problems and social adjustment in adolescent Cambodian refugees. Child Abuse Negl 1999;23:1263–1273
5. Eisenbruch M. From post-traumatic stress disorder to cultural bereavement: diagnosis of Southeast Asian refugees. Soc Sci Med 1991;33:673–680
6. Summerfield D. Cross-cultural perspectives on the medicalization of human suffering. In: Rosen GM, ed. Posttraumatic Stress Disorder: Issues and Controversies. New York, NY: John Wiley & Sons; 2004: 233–245
7. Wakefield JC. Dysfunction as a factual component of disorder. Behav Res Ther 2003;41:969–990
8. Norris FH, Alegria M. Mental healthcare for ethnic minority individuals and communities in the aftermath of disasters and mass violence. CNS Spectrums 2005;10:123–131
9. Schauer E, Ruf M, Catani C, et al. Symptoms of PTSD in Sri Lankan children affected by the Tsunami. Presented at the 9th European Conference on Traumatic Stress; June 18–21, 2005; Stockholm, Sweden
10. Forbes D, Creamer M, Biddle D. The validity of the PTSD checklist as a measure of symptomatic change in combat-related PTSD. Behav Res Ther 2001;39:977–986
11. Ruchkin VV, Schwab-Stone ME, Jones SM, et al. Is posttraumatic stress in youth a culture-bound phenomenon? a comparison of symptom trends in selected US and Russian communities. Am J Psychiatry 2005;162: 538–544
12. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington, DC: American Psychiatric Association; 1994
13. Furukawa T, Goldberg DP. Cultural invariance of likelihood ratios for the General Health Questionnaire. Lancet 1999;353:561–562
14. Chen CH, Lin SK, Tang HS, et al. The Chinese version of the Davidson Trauma Scale: a practice test for validation. Psychiatry Clin Neurosci 2001;55:493–499
15. Novy DM, Stanley MA, Averill PM, et al. Psychometric comparability of English- and Spanish-language measures of anxiety and related affective symptoms. Psychol Assess 2001;13:347–355
16. Kleijn WC, Hovens JEJM, Rodenburg JJ. Posttraumatic stress symptoms in refugees: assessments with the Harvard Trauma Questionnaire and the Hopkins Checklist-25 in different languages. Psychol Rep 2001;88: 527–532
17. Mollica RF, Caspi-Yavin Y, Bollini P, et al. The Harvard Trauma Questionnaire: validating a cross-cultural instrument for measuring torture, trauma, and posttraumatic stress disorder in Indochinese refugees. J Nerv Ment Dis 1992;180:111–116
18. Chen CH, Shen WW, Tan HK, et al. The validation study and application of stratum-specific likelihood ratios in the Chinese version of SPAN. Compr Psychiatry 2003;44:78–81
19. Gillespie K, Duffy M, Hackmann A, et al. Community based cognitive therapy in the treatment of post-traumatic stress disorder following the Omagh bomb. Behav Res Ther 2002;40:345–357
20. Boehnlein JK. Clinical relevance of grief and mourning among Cambodian refugees. Soc Sci Med 1987;25:765–772
21. Fakhr El-Islam M. Some cultural aspects of the Arab patient-doctor relationship. Bull Board Int Affairs R Coll Psych 2005;7:18–20
22. World Health Organization. 2005. Mental health assistance to the populations affected by the tsunami in South Asia. Available at: http://www.who.int/mental_health/resources/tsunami/en. Accessed October 24, 2005
23. Hinton D, Pham T, Minh T, et al. CBT for Vietnamese refugees with treatment-resistant PTSD and panic attacks: a pilot study. J Trauma Stress 2004;17:429–433
24. Otto MW, Hinton D, Korbly NB, et al. Treatment of pharmacotherapy-refractory posttraumatic stress disorder among Cambodian refugees: a pilot study of combination treatment with cognitive-behavior therapy vs sertraline alone. Behav Res Ther 2003;41:1271–1276
25. Neuner F, Schauer M, Klaschik C, et al. A comparison of narrative exposure therapy, supportive counseling, and psychoeducation for treating posttraumatic stress disorder in an African refugee settlement. J Consult Clin Psychol 2004;72:579–587
26. Lord JH, Hook M, English S. Different faiths, different perceptions of public tragedy. In: Lattanzi-Licht M, Doka KJ, eds. Coping with Public Tragedy. New York, NY: Brunner-Routledge; 2003:91–107
27. Khouzam HR, Kissmeyer P. Antidepressant treatment, posttraumatic stress disorder, survivor guilt, and spiritual awakening. J Trauma Stress 1997;10:691–696
28. Segal ZV, Williams JMG, Teasdale JD. Mindfulness-Based Cognitive Therapy for Depression: A New Approach to Preventing Relapse. New York, NY: Guilford Press; 2002

Participants may receive a maximum of 7 *AMA PRA Category 1 Credit(s)*™ by reading the material in this Supplement and correctly answering at least 70% of the questions in the Posttest that follows.

Go to SuppleNet at **www.CMEInstitute.com** to take this Posttest online and earn credit immediately.

Or

1. Read each question carefully and circle the answer on the Registration Form.
2. Type or print the registration information in the spaces provided and complete the evaluation.
3. Send the Registration Form to the address or fax number listed on the Registration Form.

All replies and results are confidential. Answer sheets, once graded, will not be returned. Unanswered questions will be considered incorrect and so scored. The CME Institute of Physicians Postgraduate Press, Inc. will keep only a record of participation, which indicates the completion of the activity and the designated number of *AMA PRA Category 1 Credit(s)*™ that have been awarded. Correct answers to the Posttest will be made available to the participants of this activity upon request after the submission deadline.

Accreditation Statement

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of the CME Institute of Physicians Postgraduate Press, Inc. and PPS International Communications. The CME Institute of Physicians Postgraduate Press, Inc. is accredited by the ACCME to provide continuing medical education for physicians.

1. Davidson and McFarlane noted that after a traumatic event, some forms of early intervention may be harmful; acute responses tend to be self-limiting and subside in most cases without deliberate intervention.

a. True
b. False

2. Davidson and McFarlane stated all of the following research data about disasters' effects on posttraumatic psychopathology *except*:

a. Disaster exposure almost always leads to the development of posttraumatic stress disorder (PTSD) in survivors
b. The intensity of exposure experienced by the population studied has a major impact on the prevalence of disorders
c. Closer proximity to the event may impact the duration of symptoms
d. Disasters causing severe, lasting, and pervasive psychological effects may be characterized by a high prevalence of injury and extreme and widespread property damage

3. Foa et al. said the development of PTSD:

a. Should be considered as occurring in a series of stages
b. Occurs within the first 4 weeks following the trauma
c. Constitutes a normal response to stress
d. Is considered to have a delayed onset if it occurs 3 months after the trauma

4. Connor et al. advised that the following self-rated instruments can facilitate rapid assessment of posttraumatic stress disorder in the field, but only the _____ has been validated in multiple cultures, settings, and languages.

a. Trauma Screening Questionnaire
b. Posttraumatic Diagnostic Scale Part 3
c. Connor-Davidson Resilience Scale 2-item short form
d. General Health Questionnaire 12-item short form

5. Davidson said that the objectives of medical treatment for PTSD include all of the following *except*:

a. Reducing its core symptoms and improving functioning
b. Strengthening resilience
c. Preventing relapse
d. Delaying treatment of comorbid disorders until core symptoms are completely resolved

6. Davidson stated that selective serotonin reuptake inhibitors and serotonergic-noradrenergic reuptake inhibitors are:

a. Effective in 2 of the symptom clusters of PTSD
b. Twice as effective in women as in men with PTSD
c. Useful in treating PTSD following all types of trauma
d. Effective in treating PTSD only in the absence of comorbid anxiety or depression

7. Foa stated that after exposure to a traumatic event, if survivors restrict their daily routine and systematically avoid reminders of the incident, the symptoms of PTSD will go away.

a. True
b. False

8. Foa cited studies that showed that more PTSD patients treated with which of the following types of cognitive-behavioral therapy experienced the best end-state functioning?
a. Prolonged exposure
b. Stress inoculation training
c. Cognitive restructuring
d. Combination treatment

9. Foa stated that cognitive-behavioral therapy, particularly prolonged exposure, is effective for the treatment of PTSD, and that following a disaster nonspecialists can be trained to deliver effective therapy.
a. True
b. False

10. Connor stated that resilient people have all of the following characteristics *except*:
a. An internal locus of control, commitment to self, and a sense of meaningfulness
b. Patience and optimism
c. Reliance solely on oneself rather than engaging the support of others
d. A sense of humor, strong self-esteem, and an action-oriented approach to problem-solving

11. According to Connor, which statement about the use of the Connor-Davidson Resilience Scale (CD-RISC) is true?
a. The CD-RISC is for use only in patients with PTSD
b. The scale is for use with English speakers only
c. Individuals without specialized mental health training can be taught to administer the self-rated scale in the field
d. The CD-RISC is a 1-item, 11-point scale for use by individuals to assess their stress vulnerability

12. Bryant observed that the trauma does not end when the disaster itself is over but rather when survivors have food, water, housing, and sanitation; knowledge of their loved ones' fates; and social stability and resolution of chaos.
a. True
b. False

13. Bryant stated that _____ is an important therapeutic target in the treatment of PTSD, especially after near-drowning or suffocation experiences.
a. Panic
b. Obsessive-compulsive disorder
c. Body dysmorphic disorder
d. Uncomplicated grief

14. Bryant stated that it is particularly important to begin cognitive-behavioral therapy while the acute trauma is ongoing.
a. True
b. False

15. Otero and Njenga drew all of the following conclusions from the Vargas flood and the Nairobi bomb *except*:
a. All disasters are alike because people everywhere have the same needs
b. Interventions should be described in the appropriate language
c. Community activities can be used to promote acceptance of mental health issues, and community leaders should be involved
d. The media should be used judiciously to promote awareness of mental health issues

16. Somasundaram and van de Put said that studies have found that PTSD is more prevalent in women than in men, although lifetime exposure to traumatic events appears to be similar for men and women.
a. True
b. False

17. According to Somasundaram and van de Put, studies of disaster cohorts comprising adults are more likely in the long-term to demonstrate severe impairment than cohorts consisting of children and adolescents.
a. True
b. False

18. Bryant and Njenga recommended that in the early days after a major traumatic event, efforts should be directed at:
a. Sending survivors to refugee camps distant from their homes
b. Early psychological intervention
c. Social support and the strengthening of individual and community resources
d. Moving children from their communities to places where they can receive group therapy

19. Bryant and Njenga stated that in Asian countries facing tsunami recovery, therapy for PTSD is best conducted one-on-one rather than in groups.
a. True
b. False

20. Bryant and Njenga cited all of the following groups as particularly vulnerable to PTSD *except*:
a. Children
b. Adolescents
c. Single parents
d. People with greater religious faith than others

Circle the one correct answer for each question.

1.	a	b			**11.**	a	b	c	d
2.	a	b	c	d	**12.**	a	b		
3.	a	b	c	d	**13.**	a	b	c	d
4.	a	b	c	d	**14.**	a	b		
5.	a	b	c	d	**15.**	a	b	c	d
6.	a	b	c	d	**16.**	a	b		
7.	a	b			**17.**	a	b		
8.	a	b	c	d	**18.**	a	b	c	d
9.	a	b			**19.**	a	b		
10.	a	b	c	d	**20.**	a	b	c	d

Print or type

Name _____

Last 4 digits of Social Security Number _____
(Required to issue CME credit)

Birth Date (mm, dd, yy) _____
(Required to issue CME credit)

Degree _____ Specialty _____

Affiliation _____

Address _____

City, State, Zip _____

Phone ( ) _____

Fax ( ) _____

E-Mail _____

❑ Hospital ❑ Private Practice ❑ Resident ❑ Intern

Deadline for submission
For a credit certificate to be issued, please complete this Registration Form no later than February 29, 2008. Online submissions will receive credit certificates immediately. Faxed or mailed submissions will receive credit certificates within 6 to 8 weeks.

Payment
No payment is necessary as this activity is free.

Please evaluate the effectiveness of this CME activity by answering the following questions.

1. Was the educational content relevant to the stated educational objectives? ❑ Yes ❑ No
2. Did this activity provide information that is useful in your clinical practice? ❑ Yes ❑ No
3. Was the format of this activity appropriate for the content being presented? ❑ Yes ❑ No
4. Did the method of presentation hold your interest and make the material easy to understand? ❑ Yes ❑ No
5. Achievement of educational objectives:
   A. Enabled me to describe the short-term and long-term impact of mass disasters on the mental health of those affected. ❑ Yes ❑ No
   B. Enabled me to employ appropriate assessment tools to assist in the identification and diagnosis of those suffering from trauma-related mental disorders. ❑ Yes ❑ No
   C. Enabled me to explain the neurobiology of posttraumatic stress reactions. ❑ Yes ❑ No
   D. Enabled me to compare mechanisms of coping with traumatic events on the individual level as well as the community level, taking cultural factors into consideration. ❑ Yes ❑ No
   E. Enabled me to identify risk factors for development of PTSD and predictors of good response to treatment. ❑ Yes ❑ No
   F. Enabled me to identify and distinguish treatments that are effective, ineffective, or even harmful. ❑ Yes ❑ No
   G. Enabled me to assess resiliency and recovery in individuals affected by trauma. ❑ Yes ❑ No
6. Did this CME activity provide a balanced, scientifically rigorous presentation of therapeutic options related to the topic, without commercial bias? ❑ Yes ❑ No
7. Does the information you received from this CME activity confirm the way you presently manage your patients? ❑ Yes ❑ No
8. Does the information you received from this CME activity change the way you will manage your patients in the future? ❑ Yes ❑ No
9. If you answered yes, what change(s) do you intend to make in your practice?

   _____

10. Please offer comments and/or suggested topics for future CME activities.

    _____

11. How much time did you spend completing this CME activity?

    _____

12. What is your preferred format for CME activities? Circle one.
    A. Print media (e.g., journals, supplements, and newsletters)
    B. Internet text
    C. Internet multimedia
    D. Audio CD
    E. Live meeting

SEND THIS PAGE TO:
CME INSTITUTE • PHYSICIANS POSTGRADUATE PRESS, INC. • P.O. BOX 752870 • MEMPHIS, TN 38175-2870
YOU MAY FAX THIS PAGE TO: CME INSTITUTE AT 901-751-3444
QUESTIONS? CALL 1-800-489-1001, EXT. 8 • **WWW.CMEINSTITUTE.COM**

NOTES

NOTES

Faculty Disclosure

In the spirit of full disclosure and in compliance with all ACCME Essential Areas and Policies, the faculty for this CME activity were asked to complete a full disclosure statement. The information received is as follows:

Dr. Davidson has received research support from Pfizer, Solvay, Eli Lilly, GlaxoSmithKline, Forest, Wyeth, Organon, PureWorld, Allergan, Nutrition 21, Bristol-Myers Squibb, Johnson & Johnson, Cephalon, AstraZeneca, Parke Davis, Pharmacia, Upjohn, UCB Pharma, Merck, and Janssen; is a member of the advisory boards for Solvay, Pfizer, GlaxoSmithKline, Forest, Eli Lilly, Ancile, Roche, MediciNova, Jazz, Novartis, Organon, Boehringer Ingelheim, MedTap, Research Triangle Institute, AstraZeneca, Johnson & Johnson, Wyeth, Bristol-Myers Squibb, Boots, UCB Pharma, Sanofi-Synthelabo, Alexza, and Janssen; is a speaker for Solvay, Pfizer, GlaxoSmithKline, Wyeth, Lichtwer Pharma GMbH, Forest, and American Psychiatric Association; has had study drugs supplied by Eli Lilly, Schwabe, PureWorld, and Pfizer; has received royalties from MultiHealth Systems Inc., Guilford Publications, American Psychiatric Association, Penguin Putnam Publishers, Current Medical Science, Martin Dunitz, and Taylor and Francis; and has worked as an expert witness.

Dr. Connor has received grant/research support from Eli Lilly, Pfizer, Pure World Botanicals, and Forest; is a member of the speakers bureau for Ortho-McNeil, Pfizer, Wyeth-Ayerst, Cephalon, Solvay, and Forest; is a consultant for Ancile, Ortho-McNeil, Wyeth-Ayerst, Pfizer, and Solvay; and has received other financial or material support from Schwabe, Nutrition 21, Cephalon, and Nordic Naturals.

Dr. Foa has received research support from Pfizer, Solvay, Eli Lilly, GlaxoSmithKline, Cephalon, Bristol-Myers Squibb, Forest, Ciba Geigy, Kali-Duphar, and American Psychiatric Association and has been a speaker for Pfizer, GlaxoSmithKline, Forest, and American Psychiatric Association.

Dr. McFarlane is a consultant for Australian Defense Force and Department of Veterans Affairs; has received a Program Grant (No. 300403) from the National Health and Medical Research Council, Canberra, Australia; is funded by the Centre for Military and Veterans Health Board, University of Queensland, Herston, Australia; is a major stock shareholder in Brain Resource Company; and is an expert witness in various third party and negligence claims.

Dr. Njenga is a consultant for and member of the speakers/advisory boards of Eli Lilly, has received grant/research support from GlaxoSmithKline, and has received honoraria from Pfizer.

Dr. Stein has received grant/research support and/or consultancy honoraria from AstraZeneca, Eli Lilly, GlaxoSmithKline, Lundbeck, Orion Pharma, Pfizer, Pharmacia, Roche, Servier, Solvay, Sumitomo, and Wyeth.

Drs. Bryant, Otero, Somasundaram, and van de Put have no significant commercial relationships to disclose relative to their presentations.