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MOTOR VEHICLE ACCIDENT SURVIVORS AND PTSD

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Over 3 million Americans are injured in motor vehicle accidents (MVAs) each year. The National Comorbidity Study (Kessler et al., 1995) found accidents (most of which were probably MVAs) to be the most frequent traumatic event experienced by males (25%) and second most frequent event for females (13.3%). Given what we have learned about MVAs as a cause of PTSD, MVAs may be the leading cause of short-term (duration of a year or less) PTSD in the USA.

Blanchard and Hickling (1997) in their book, *After the Crash*, have summarized much of the English-language literature on the psychosocial sequelae of MVAs as well as detailing their own research on the psychological assessment and treatment of MVA survivors. Taylor and Koch (1995) provided a comprehensive review of the psychiatric consequences of MVAs through 1994 with particular attention to anxiety disorders. Mayou (1992) provided an earlier review of this literature.

What Fraction of Injured MVA Survivors Develop PTSD? This rhetorical question draws a variety of answers from studies of non-referred populations assessed and followed up prospectively: ranging from 8% at 3 months and 11.1% within 12 months, diagnosed by Present State Examination (Mayou et al., 1993), to 39.2% (43.7% including delayed onset) diagnosed with the CAPS (Blanchard et al., 1995). Other values include 23.8% at 3 weeks (SCID diagnosis; Delahanty et al., 1997), 25.4% at 6 months (Composite International Diagnostic Interview; Harvey & Bryant, 1998), and 23.1% of 888 cases (Posttraumatic Stress Symptoms Scale questionnaire diagnosis; Ehlers et al., in press). Using the Ehlers figure (because of the large sample size), this would translate into roughly 800,000 new cases of PTSD per year in the USA.

What Are the Other Psychosocial Consequences of MVAs? The primary psychosocial consequences of MVAs beyond PTSD fall into the category of psychiatric co-morbidity, with four findings emerging. First, mood disorders, especially new cases of major depression, are the most common co-morbid problem: Blanchard et al. (1995) found that 43.5% of their MVA survivors with PTSD also developed a new major depressive episode and that 56.5% of the survivors with PTSD had a current mood disorder. Feinstein and Dolan (1991) found that 12.5% of their total sample had notable depressive symptoms; Mayou et al. (1993) found that 6.9% of a total 188 cases had a diagnosable mood disorder or anxiety at 3 months post-MVA. Second, Blanchard et al. (1995) found that 27.4% of survivors with PTSD had another current co-morbid anxiety disorder. Third, several studies use a measure of "caseness," or sufficient symptoms on some measure to constitute a psychiatric case: Mayou et al. (1993) found that 13.3% had psychiatric disorders; Green et al. (1993) found significant symptoms in 33%; and Malt et al. (1993) identified 37% of 183 hospitalized MVA survivors as psychiatric cases with the GHQ.

Finally, there is travel anxiety and driving reluctance: Mayou et al. (1993) found that 18.4% had travel anxiety at a 1-year post-MVA assessment; Kuch et al. (1994) reported 38.2% with accident phobia. Blanchard et al. (1995) found 15.1% of PTSDs to have a driving phobia, whereas 93% manifested "driving reluctance" (some form of avoidance behavior).

Who Develops PTSD from MVAs? The answer to this question yields noticeably contradictory answers. Blanchard et al. (1996c) found four independent predictors of who develops PTSD: (a) a history of a pre-MVA major depressive episode (although Mayou et al., 1993, found immediate post-MVA depression did not predict PTSD at 3 months); (b) extent of physical injury, which was replicated in part by Ehlers et al. (in press) (however, Feinstein & Dolan, 1991, Green et al., 1993, and Bryant & Harvey, 1996, found that extent of injury did *not* predict PTSD); (c) the degree of fear of dying in the MVA (replicated by Green et al., 1993, and Ehlers et al., in press); and (d) whether litigation was initiated (Ehlers et al., in press, confirmed this variable).

Other predictors hypothesized are strong "horrific and intrusive memories" (Mayou et al., 1993), a finding which was replicated by Green et al. (1993), as well as not being responsible for the MVA, which was found to predict significantly greater likelihood of developing PTSD in a 1997 study by Delahanty et al. (We replicated this finding and also the slower remission reported by Delahanty et al., in 1997). Also significant was the presence of initial Acute Stress Disorder (ASD) or sub-clinical ASD predicted at 6 months (Harvey & Bryant, 1998); Ehlers et al. (in

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press) also found that initial dissociative symptoms, the hallmark of ASD, predicted PTSD at 3 months. Finally, female gender was found by Ehlers et al. (in press) to predict development of PTSD independently (a finding reported earlier by Blanchard et al., 1995).

Delayed-onset PTSD. That the onset of PTSD can significantly lag the trauma is well recognized; four MVA studies have documented this phenomenon among MVA survivors. Green et al. (1993), in a prospective study of 24 MVA survivors, found 5 cases (20.8%) of delayed-onset PTSD at 18 months. All had a sub-syndromal form of PTSD at 1 month post-MVA. Mayou et al. (1993) found 6 (of 174, 3.4%) cases of PTSD at 1 year who had not been positive at 3 months. From our laboratory, Buckley et al. (1996) identified 7 cases (4.4% of the original sample) of delayed-onset PTSD. All had an initial diagnosis of sub-syndromal PTSD; interestingly, they were significantly lower in social support and had more overall distress than those with sub-syndromal PTSD who did not develop delayed onset. A proximal stressor could be identified in only 3 of the 7 cases. Finally, Ehlers et al. (in press) found 6.2% of their sample ($n = 34$) who were not positive for PTSD at 3 months were positive at the 12-month follow-up.

What Is the Natural History of MVA-Related PTSD and What Predicts Remission? Given that the MVA-survivor has developed PTSD, the next important questions are framed above: how much spontaneous remission is there, and what variables predict remission versus persistence of the diagnoses? Early answers to these questions from prospective follow-up studies were: (a) remission by 6 months of 5 out of 12 (41.7%, Feinstein & Dolan, 1991); (b) no remission at an 18-month follow-up; indeed, 5 out of 7 with sub-clinical PTSD were worse (Green et al., 1993); and (c) remission at 12 months of 5 out of 13 (38.5%) who were positive for PTSD at 3 months (Mayou et al., 1993). No predictors of remission were identified in these studies.

From our laboratory, we (Blanchard & Hickling, 1997) found that 48% of those initially diagnosed with PTSD had remitted 6 months later; in a longer follow-up (12 months) we (Blanchard et al., 1996a) found that only 33% of those initially diagnosed with PTSD still met the diagnostic criteria. There was little additional remission at 18 months. Variables that predicted remission at 6 months were: initial CAPS score; initial severity of injury; degree of physical recovery by month 4; and whether there had been a new trauma for a family member. The one-year prediction included an initial degree of irritability, a sense of foreshortened future, and a heightened degree of vulnerability when traveling.

Delahanty et al. (1997) found a 53% remission rate at the 12-month follow-up, with the attribution of a responsibility variable (those who blamed themselves remitted more quickly than those who blamed someone else) being the major predictor. Ehlers et al. (in press) found a 50% remission rate in their large-scale study at a 12-month follow-up point.

Finally, Mayou et al. (1997) reported on the 5-year follow-up assessment of their initial (Mayou et al., 1993) prospective follow-up sample. Although most initial cases of PTSD had remitted, there were a number of delayed-onset cases resulting in approximately 10% of the sample's being positive for PTSD throughout the follow-up. PTSD at 5 years was predicted by continued physical problems and continued intrusive memories and emotional distress.

The Role of Litigation and its Settlement. As Blanchard and Hickling (1997) note on this topic, "It is widely believed that litigation and its settlement play a large role in the natural history of psychological symptoms and disability among accident victims" (p.171). The empirical data to support this point are weak, however. Both Ehlers et al. (in press) and Blanchard et al. (1996c) found that having initiated litigation early after the MVA predicted a higher likelihood that a MVA survivor would meet the criteria for PTSD. In a 3-year follow-up of his 200 MVA survivors seen in the ER, Mayou (1995) pointed out a lack of effect of initiating (or not initiating) litigation on long-term outcome. Moreover, for those litigants who had settled by the 3-year point, there was some evidence of more improved status than those whose suits were still pending.

Blanchard et al. (1998) found those who initiated litigation had a greater degree of physical injury and higher CAPS scores than those who did not file suit. Comparing litigants who settled within the first 12 months to those who did not, there are non-significant trends toward more symptomatic improvement for those who settle than for those who have not settled (both groups improve over time significantly on CAPS, BDI, and IES). There was also a trend for those who had been employed full-time pre-MVA and who had not settled to be less likely to have returned to work (84%) than among comparable litigants who had settled by 12 months (100%).

Psychophysiological Assessment and MVA-Related PTSD. Measurement of psychophysiological responses to cues reminiscent of the MVA trauma has found a role in the comprehensive assessment of MVA survivors, especially in the measurement of heart rate (HR) response to idiosyncratic audiotaped descriptions of the accident. Blanchard et al. (1994) reported this finding on their first 50 MVA survivors and then reported a replication with another 105 MVA survivors (Blanchard et al., 1996b). The average HR response of those MVA survivors with PTSD was +4.2 beats per minute (bpm) as compared to a response of +0.3 bpm among those with sub-syndromal PTSD. Diagnostic efficiency was 67.9% with a cutoff of +2 bpm.

Interestingly, Blanchard et al. (1996b) found among initial PTSDs that HR response predicted clinical status at a 12-month follow-up: those who continued to be positive for PTSD 12 months later had greater responsivity than those who remitted partially or fully (77.1% diagnostic efficiency).

Shalev et al. (1998) has found that elevated basal HR (greater than 90 bpm) in the ER predicts a higher likelihood of the MVA survivor's being diagnosed with PTSD at a 3-month follow-up than for those with lower resting HRs. It appears that a high level of initial sympathetic activation at the time of the trauma is a risk for developing PTSD.

Treatment of MVA-Related PTSD. There are summarized in Chapter 14 of Blanchard and Hickling's (1997) book a number of case reports and uncontrolled trials of various forms of psychological treatment for MVA-related PTSD. Three randomized controlled trials have been conducted with MVA survivors; all were characterized by relatively brief interventions delivered within days to weeks of the MVA.

Hobbs et al. (1996) approached consecutively admitted MVA survivors at a British hospital, eliminating those with no psychological symptoms and those who could not remember the MVA (because of head trauma). Only 8 of 114 eligible MVA survivors declined: 54 in the intervention group received one hour's treatment emphasizing review of the traumatic experience, emotional expression, and cognitive processing of the experience and education on what to expect as well as an information booklet. The 52 controls were assessed only initially. All were re-assessed at 4 months post-MVA. Twenty-two percent were lost to post-assessment. Overall, there was no effect from the intervention and no decrease in IES score in either group at the 4-month follow-up.

Brom et al. (1993) were able to recruit 20.4% of 738 Dutch MVA survivors approached by the Dutch police, with more responses from those randomized to treatment (36%) than to assessment only (13%). Treatment was 3 to 6 sessions 2-3 months post-MVA, focusing on education, support, and reality testing. There was noticeable improvement in both groups on a Dutch version of the IES at a point 6 months post-MVA. Thus the study showed no advantages for brief, early treatment.

Bryant et al. (in press) randomized 24 MVA survivors with ASD to 5 sessions of cognitive behavior therapy (CBT) or supportive counseling (SC) within two weeks of the MVA. Fewer participants in CBT (8%) than in SC (83%) met criteria for PTSD at post-treatment. There were also fewer cases of PTSD at a 6-month follow-up in the CBT condition (17%) than in the SC condition (67%).

Hickling and Blanchard (1997) reported on the systematic cognitive behavioral treatment of 10 MVA survivors with PTSD or severe sub-syndromal PTSD, 6 to 24 months post-MVA. Treatment involved relaxation, exposure, cognitive restructuring, and pleasant events scheduling over 8 to 12 sessions. Average CAPS score dropped from 67 to 22, with a further drop to 18 at a 3-month follow-up. Eight out of 10 were noticeably improved.

Given the relatively high spontaneous remission rate over the first year after the trauma (50% or better), and the poor results from brief early interventions, it appears that a good strategy may be to withhold treatment over the first 6 months post-MVA and then treat those who are noticeably symptomatic at that point with a brief cognitive behavioral package. Alternatively one may want to identify those with ASD and use the intervention of Bryant et al. (in press) early on. Research interest in this widespread problem appears to be growing, which bodes well for the thousands of MVA survivors who develop posttraumatic stress symptoms.

SELECTED ABSTRACTS

BLANCHARD, E.B., & HICKLING, E.J. (1997). *After the crash: Assessment and treatment of motor vehicle accident survivors.* Washington, DC: American Psychological Association. This book describes the details of a 5-year study of MVA survivors in the Albany, New York area. We have tried to summarize and integrate the results from this worldwide array of research groups with our own findings to present a comprehensive view of what is known about the survivors of serious MVAs. This book covers four cross-cutting conceptual themes. First, we identify the scope of the problem to try to arrive at an answer to the question, "What proportion of motor vehicle accident survivors develop PTSD?" The second broad theme is a description of the short-term psychosocial consequences of having been in a serious MVA. The third theme is the short-term history of MVA-related PTSD and factors that can influence this, such as physical injury, litigation and delayed-onset PTSD. Our fourth conceptual theme is the psychological treatment of the MVA survivor with PTSD. We foresee three broad audiences for this book: psychologists, psychiatrists and other mental health professionals who assess and treat the survivors of serious MVA; attorneys who handle MVA survivor cases; and physicians who treat MVA survivors.

BLANCHARD, E.B., HICKLING, E.J., BARTON, K.A., TAYLOR, A.E., LOOS, W.R., JONES-ALEXANDER, J. (1996). **One-year prospective follow-up of motor vehicle accident victims.** *Behaviour Research and Therapy, 34,* 775-786. 132 victims of motor vehicle accidents (MVAs), who sought medical attention as a result of the MVA, were assessed at 3 points in time: 1-4 months post-MVA, 6 months later, and 12 months later. Of the 48 who met the full criteria for PTSD initially, half had remitted at least in part by the 6-month follow-up point and two-thirds had remitted by the 1-yr follow-up. Using logistic regression, 3 variables combined to correctly identify 79 percent of remitters and non-remitters at the 12-month follow-up point: initial scores on the irritability and foreshortened future symptoms of PTSD and the initial degree of vulnerability the subject felt in a motor vehicle after the MVA. 4 variables combined to predict 64 percent of the variance in the degree of post-traumatic stress symptoms at 12 months: presence of alcohol abuse and/or an Axis-II disorder at the time of the initial assessment as well as the total scores on the hyperarousal and on avoidance symptoms of PTSD present at the initial post-MVA assessment.

BLANCHARD, E.B., HICKLING, E.J., BUCKLEY, T.C., TAYLOR, A.E., VOLLMER, A., & LOOS, W. R. (1996). **Psychophysiology of posttraumatic stress disorder related to motor vehicle accidents: Replication and extension.** *Journal of Consulting and Clinical Psychology, 64,* 742-751. Psychophysiological assessment data, including heart rate (HR), blood pressure, and frontal electromyogram (EMG) responses to mental arithmetic, idiosyncratic audiotape descriptions of motor vehicle accidents (MVAs), and a standard videotape of MVAs, were collected on 105 injured victims of recent MVAs and 54 non-MVA controls. Their data replicated data from an earlier report and support the utility of HR response to the audio taped description of the MVA as useful

in distinguishing MVA victims with PTSD from those with subsyndromal PTSD and non-PTSD. At a 1-year follow-up, the psychophysiological assessment was repeated on 125 MVA victims; results showed a general diminution of psychophysiological responding. Initial psychophysiological assessment results predicted 1-year follow-up clinical status (continued PTSD or full or partial remission) for 37 of 48 individuals who initially met criteria for PTSD.

BLANCHARD, E.B., HICKLING, E.J., TAYLOR, A.E., LOOS, W.R., FORNERIS, C.A. , & JACCARD, J. (1996). **Who develops PTSD from motor vehicle accidents?** *Behaviour Research and Therapy, 34,* 1-10. Within 1 to 4 months of their motor vehicle accident (MVA), we assessed 158 MVA victims who sought medical attention as a result of the MVA. Using the Clinician-Administered PTSD Scale, we found that 62 (39 percent) met DSM-III-R criteria for PTSD. Using variables from the victim's account of the accident and its sequelae, pre-MVA psychosocial functioning, demographic variables, pre-MVA psychopathology and degree of physical injury, we found that 70 percent of the subjects could be classified as PTSD or not with 4 variables: prior major depression, fear of dying in the MVA, extent of physical injury and whether litigation had been initiated. Using multiple regression to predict the continuous variable of total CAPS score, as a measure of post-traumatic stress symptoms, we found that 8 variables combined to predict 38.1 percent of variance (Multiple R = 0.617).

BLANCHARD, E.B., HICKLING, E.J., TAYLOR, A.E., & LOOS, W. (1995). P**sychiatric morbidity associated with motor vehicle accidents.** *Journal of Nervous and Mental Disease, 183,* 495-504. The primary purpose of this report was to determine the extent of psychiatric morbidity and comorbidity among a sample of recent victims of motor vehicle accidents (MVAs) in comparison to a nonaccident control population. Victims of recent MVAs (N = 158), who sought medical attention as a result of the MVA, were assessed in a University-based research clinic, 1 to 4 months after the accident for acute psychiatric and psychosocial consequences as well as for pre-MVA psychopathology using structured clinical interviews (Clinician-Administered PTSD Scale, SCID, SCID-II, LIFE Base). Age- and gender-matched controls (N = 93) who had no MVAs in the past year served as controls. 62 MVA victims (39.2 percent) met DSM-III-R criteria for PTSD, and 55 met DSM-IV criteria. The MVA victims who met the criteria for PTSD were more subjectively distressed and had more impairment in role function (performance at work/school/homemaking, relationships with family or friends) than the MVA victims who did not meet the PTSD criteria or the controls. A high percentage (53 percent) of the MVA-PTSD group also met the criteria for current major depression, with most of that developing after the MVA. A prior history of major depression appears to be a risk factor for developing PTSD after an MVA (p = .0004): 50 percent of MVA victims who developed PTSD had a history of previous major depression, as compared with 23 percent of those with a less severe reaction to the MVA. A prior history of PTSD from earlier trauma also is associated with developing PTSD or a subsyndromal form of it (25.2 percent) (p = .0012). Personal injury MVAs exact substantial psychosocial costs on the victims. Early intervention, especially in vulnerable populations, might prevent some of this.

BRYANT, R. A., HARVEY, A.G., DANG, S.T., SACKVILLE, T., & BASTEN, C. (in press). **Treatment of acute stress disorder: A comparison of cognitive behavior therapy and supportive counseling.** *Journal of Consulting and Clinical Psychology.* Acute stress disorder (ASD) is a precursor of chronic PTSD. Twenty-four participants with ASD following civilian trauma were given 5 sessions of either cognitive behavior therapy (CBT) or supportive counseling (SC) within 2 weeks of their trauma. Fewer participants in CBT (8%) than SC (83%) met criteria for PTSD at posttreatment. There were also fewer cases of PTSD in the CBT (17%) than SC (67%) conditions 6 months posttrauma. There were greater statistically and clinically significant reductions in intrusive, avoidance, and depressive symptomatology in the CBT than SC participants. This study represents the first demonstration of successful treatment of ASD with CBT, and its efficacy in preventing chronic PTSD.

BUCKLEY, T.C., BLANCHARD, E.B., & HICKLING, E.J. (1996). **A prospective examination of delayed onset PTSD secondary to motor vehicle accidents.** *Journal of Abnormal Psychology, 105,* 617-625. 7 participants who did not meet the DSM-III-R criteria for PTSD 1-4 months post- motor vehicle accident (MVA) and developed delayed onset PTSD during a 1-year follow-up interval were compared with 38 MVA controls who did not develop PTSD, as well as to 62 MVA participants who met criteria for acute onset PTSD on variables related to demographics, pre-MVA functioning, post-MVA functioning, and follow-up. The delayed onset participants were more symptomatic at the time of the initial interview than the controls. The delayed onset participants had poorer social support than the controls prior to and after the MVA. For the month prior to the MVA, the delayed onset participants had lower Global Assessment of Functioning scores than the controls.

DELAHANTY, D.L., HERBERMAN, H.B., CRAIG, K.J., HAYWARD, M.C., FULLERTON, C.S., URSANO, R.J. & BAUM, A. (1997). **Acute and chronic distress and posttraumatic stress disorder as a function of responsibility for serious motor vehicle accidents.** *Journal of Consulting and Clinical Psychology, 65,* 560-567. In this study on the effects of attributions of responsibility for traumatic events, stress, coping, and symptoms of PTSD were measured, including intrusive thoughts, among 130 victims of serious motor vehicle accidents (MVAs) 14-21 days and 3, 6, and 12 months after their accident. MVA victims and 43 control participants were categorized by accident and attribution of responsibility for their accidents (self-responsible, other-responsible, and control). Although initially all MVA victims reported higher levels of intrusive thoughts and were more likely to meet criteria for PTSD diagnoses, only other-responsible participants continued to demonstrate increased distress 6 and 12 months postaccident. Self-responsible participants used more self-blame coping than other-responsible participants, although within the self-responsible group, use of self-blame was associated with more distress.

EHLERS, A., MAYOU, R.A., & BRYANT, B. (in press). **Psychological predictors of chronic posttraumatic stress disorder after motor vehicle accidents.** *Journal of Abnormal Psychology.* A prospective longitudinal study assessed 967 consecutive patients who attended an emergency clinic shortly after a motor vehicle accident, again at 3 months and at 1 year. The prevalence of PTSD was 23.1% at 3 months and 16.5% at 1 year. Chronic PTSD was related to some objective measures of trauma severity, perceived threat, and dissociation during the accident, to female gender, to previous emotional problems, and to litigation. Maintaining psychological factors, that is, negative interpretation of intrusions, rumination, thought suppression, and anger cognitions, enhanced the accuracy of the prediction. Negative interpretation of intrusions, persistent medical problems, and rumination at 3 months were the most important predictors of PTSD symptoms

at 1 year. Rumination, anger cognitions, injury severity, and prior emotional problems identified cases of delayed onset.

HARVEY, A.G., & BRYANT, R.A. (1998). **The relationship between acute stress disorder and posttraumatic stress disorder: A prospective evaluation of motor vehicle accident survivors.** *Journal of Consulting and Clinical Psychology, 66,* 507-512. Motor vehicle accident survivors (n = 92) were assessed for acute stress disorder (ASD) within 1 month of the trauma and reassessed (n = 71) for PTSD 6 months posttrauma. ASD was diagnosed in 13 percent of participants, and a further 21 percent had subclinical levels of ASD. At follow-up, 78 % of ASD participants and 60% of subclinical ASD participants met criteria for PTSD. The strong predictive power of acute numbing, depersonalization, a sense of reliving the trauma, and motor restlessness, in contrast to the low to moderate predictive power of other symptoms, indicates that only a subset of ASD symptoms is strongly related to the development of chronic PTSD. Although these findings support the use of the ASD diagnosis, they suggest that the dissociative and arousal clusters may require revision.

HICKLING, E.J., & BLANCHARD, E.B. (1997). **The private practice psychologist and manual-based treatments: Post-traumatic stress disorder secondary to motor vehicle accidents.** *Behaviour Research and Therapy, 35,* 191-203. This paper discusses the issues of providing an empirically validated, manual-based treatment when viewed from the perspective of a practicing clinical psychologist. The trend for empirically proven treatment is reviewed briefly, and initial data are provided illustrating a manual-based-treatment for PTSD following a motor vehicle accident. The relatively brief (9-12 session) psychological treatment was effective in reducing PTSD symptoms as measured on the Clinician Administered PTSD Scale, for all 10 subjects. The results are discussed from the practicing clinician's perspective: generalization to a clinical population, ethical concerns of limited treatment goals, individually tailored vs standardized treatments in clinical practice, concerns for co-morbid conditions, and how this type of study might impact on practice in an era of managed health care. Issues of incorporating manual-based treatments into clinical practice are discussed, with consideration of gains, the limits and the constraints this would bring to the practice of psychology.

HOBBS, M., MAYOU, R., HARRISON, B., & WORLOCK, P. (1996). **A randomised controlled trial of psychological debriefing for victims of road traffic accidents.** *British Medical Journal, 313,* 1438-1439. This randomised controlled study aimed to test whether a single debriefing could reduce post-traumatic psychopathology in road accident victims. [Text, p. 1438]

MAYOU, R., BRYANT, B., & DUTHIE, R. (1993). **Psychiatric consequences of road traffic accidents.** *British Medical Journal, 307,* 647-651. OBJECTIVE: To determine the psychiatric consequences of being a road traffic accident victim. DESIGN: Follow up study of road accident victims for up to one year. SETTING: Emergency department of the John Radcliffe Hospital, Oxford. SUBJECTS: 188 consecutive road accident victims aged 18-70 with multiple injuries (motorcycle or car) or whiplash neck injury, who had not been unconscious for more than 15 minutes, and who lived in the catchment area. Main outcome measures: Present state examination ''caseness''; PTSD and travel anxiety; effects on driving and on being a passenger. RESULTS: Acute, moderately severe emotional distress was common. Almost one fifth of subjects, however, suffered from an acute stress syndrome characterised by mood disturbance and horrific memories of the accident. Anxiety and depression usually improved over the 12 months, though one tenth of patients had mood disorders at one year. In addition, specific post-traumatic symptoms were common. PTSD occurred during follow up in one tenth of patients, and phobic travel anxiety as a driver or passenger was more common and frequently disabling. Emotional disorder was associated with having pre-accident psychological or social problems and, in patients with multiple injuries, continuing medical complications. Post-traumatic syndromes were not associated with a neurotic predisposition but were strongly associated with horrific memories of the accident. They did not occur in subjects who had been briefly unconscious and were amnesic for the accident. Mental state at three months was highly predictive of mental state at one year. CONCLUSIONS: Psychiatric symptoms and disorder are frequent after major and less severe road accident injury. Post-traumatic symptoms are common and disabling. Early information and advice might reduce psychological distress and travel anxiety and contribute to road safety and assessing ''nervous shock.''

ADDITIONAL CITATIONS
Annotated by the Editors

BLANCHARD, E.B., HICKLING, E.J., FORNERIS, C.A., TAYLOR, A.E., BUCKLEY, T.C., LOOS, W.R., & JACCARD, J. (1997). **Prediction of remission of acute posttraumatic stress disorder in motor vehicle accident victims.** *Journal of Traumatic Stress, 10,* 215-234.

Assessed PTSD in 145 MVA survivors at 1-4 months post-MVA and then 6 months later. Remission at the second assessment occurred in 55% of the 55 survivors with initial PTSD and 67% of the 43 survivors with sub-syndromal PTSD. Increased likelihood of remission was associated with lower initial PTSD severity, no new family trauma, lower initial injuries, and lower injury at 4 months.

BLANCHARD, E.B., HICKLING, E.J., TAYLOR, A.E., BUCKLEY, T.C., LOOS, W.R., & WALSH, J. (1998). **Effects of litigation settlements on posttraumatic stress symptoms in motor vehicle accident victims.** *Journal of Traumatic Stress, 11,* 337-354.

Assessed the effects associated with litigation in 132 MVA survivors who were studied 1-4 months and 12 months post-accident. Of the 67 survivors who initiated litigation, 27% had settled by 1 year. Litigation was associated with more severe injuries and higher initial PTSD symptoms. Litigants did not improve in anxiety and depression ratings, whereas nonlitigants improved in these domains.

BLANCHARD, E.B., HICKLING, E.J., TAYLOR, A.E., LOOS, W.R., & GERARDI, R.J. (1994). **The psychophysiology of motor vehicle accident related posttraumatic stress disorder.** *Behavior Therapy, 25,* 453-467.

Performed psychophysiological assessment of 50 MVA survivors and 40 non-MVA controls. Increased heart rate in response

to an idiosyncratic trauma script distinguished survivors with full PTSD from controls and survivors with partial or no PTSD. Groups did not differ in response to other stressors.

BROM, D., KLEBER, R.J., & HOFMAN, M.C. (1993). **Victims of traffic accidents: Incidence and prevention of post-traumatic stress disorder.** *Journal of Clinical Psychology, 49,* 131-140.
Randomly assigned survivors of serious MVAs in The Netherlands to either an intervention group ($n = 68$) or to a monitoring control condition ($n = 83$). Participants were selected from police logs and were not seeking treatment. Controlling for initial symptom severity, the authors failed to find a difference between conditions at a 6-month follow-up.

BRYANT, R.A. & HARVEY, A.G. (1996). **Initial posttraumatic stress responses following motor vehicle accidents.** *Journal of Traumatic Stress, 9,* 223-234.
Assessed PTSD symptoms in 114 MVA survivors within 2 weeks of hospital admission. Intrusion and avoidance were related to different risk factors: intrusion was best predicted by fear of the MVA and absence of head injury, whereas avoidance was best predicted by fear of the accident and recent stressful events.

FEINSTEIN, A. & DOLAN, R. (1991). **Predictors of post-traumatic stress disorder following physical trauma: An examination of the stressor criterion.** *Psychological Medicine, 21,* 85-91.
Prospectively assessed 48 adults who had experienced an accidental physical injury; 21% of the accidents involved pedestrians, 6% involved autos, and 29% involved motorbikes. Two variables predicted the presence of PTSD at 6 months: initial PTSD symptoms and excessive alcohol consumption.

GREEN, M.M., MCFARLANE, A.C., HUNTER, C.E., & GRIGGS, W.M. (1993). **Undiagnosed post-traumatic stress disorder following motor vehicle accidents.** *Medical Journal of Australia, 159,* 529-534.
Prospectively assessed 24 MVA survivors at 1 and 18 months post-MVA. At 18 months, 25% had PTSD, although none had been diagnosed or treated. One month measures that predicted the development of PTSD at 18 months included perceived life threat, PTSD symptoms, depression symptoms, global distress, and immature defenses.

KESSLER, R.C., SONNEGA, A., BROMET, E.J., HUGHES, M., & NELSON, C.B. (1995). **Posttraumatic stress disorder in the National Comorbidity Survey.** *Archives of General Psychiatry, 52,* 1048-1060.
Assessed PTSD as a function of different types of trauma in a nationally-representative sample of over 5,000 US men and women (age 15-54). Twenty-five percent of the men and 14% of the women had experienced a life-threatening accident (including MVAs). The prevalence of PTSD among accident survivors was 6% among men and 9% among women.

KUCH, K., COX, B.J., EVANS, R., & SHULMAN, I. (1994). **Phobias, panic, and pain in 55 survivors of road vehicle accidents.** *Journal of Anxiety Disorders, 8,* 181-187.
Assessed 55 minimally-injured MVA survivors who had little chronic pain. Almost 40% met DSM criteria for simple phobia with onset of the MVA and 24% met criteria for PTSD. Phobics and nonphobics did not differ in gender, pain location, or pain severity.

MALT, U.F., HOIVIK, B., & BLIKRA, G. (1993). **Psychosocial consequences of road accidents.** *European Psychiatry, 8,* 227-228.
Briefly reports on 3-year follow-up studies in Norway of two cohorts of injured MVA survivors (including a child sample) and on a cohort of family members of MVA survivors. Prevalence of PTSD was 5%, although other psychiatric and behavioral problems were prevalent in a higher number of survivors, e.g., 14% of children had reduced physical performance capacity.

MAYOU, R. (1992). **Psychiatric aspects of road traffic accidents.** *International Review of Psychiatry, 4,* 45-54.
Discusses psychiatric issues related to MVAs. A useful aspect of the paper is its inclusion of information about the effects of MVAs on alcohol and substance abuse and on social outcomes, such as occupational functioning and financial problems.

MAYOU, R. (1995). **Medico-legal aspects of road traffic accidents.** *Journal of Psychosomatic Research, 39,* 789-798.
Discusses legal aspects of MVAs and primarily focuses on issues related to compensation. Whiplash injury is specifically discussed. Three-year follow-up data from a prospective study of compensation-seekers is presented.

MAYOU, R., TYNDEL, S., & BRYANT, B. (1997). **Long-term outcome of motor vehicle accident injury.** *Psychosomatic Medicine, 59,* 578-584.
Conducted a 5-year follow-up of MVA survivors who had previously taken part in a 1-year prospective study. There was little average change in outcomes across the 3 assessment points at 3 months, 1 year, and 5 years. The prevalence of PTSD was approximately 10% at all assessments, although most early cases remitted and later cases reflected delayed onset.

SHALEV, A.Y., SAHAR, T., FREEDMAN, S., PERI, T., GLICK, N., BRANDES, D., ORR, S.P., & PITMAN, R.K. (1998). **A prospective study of heart rate response following trauma and the subsequent development of posttraumatic stress disorder.** *Archives of General Psychiatry, 55,* 553-559.
Assessed 86 MVA survivors in Israel in the hospital emergency room and then 1 week, 1 month, and 4 months later. Heart rate in the emergency room was elevated among survivors who had PTSD at 4 months, relative to those who did not have PTSD; this effect maintained even when the authors adjusted for multiple covariates.

TAYLOR, S., & KOCH, W. J. (1995). **Anxiety disorders due to motor vehicle accidents: Nature and treatment.** *Clinical Psychology Review, 15,* 721-738.
Qualitatively reviews the clinical features, etiologic theories, prevalence, and treatment of anxiety disorders related to MVAs: accident phobia, PTSD, and partial PTSD. This is an excellent single source for a summary of the literature prior to 1995.

Research at the Pacific Islands Division of the National Center for PTSD

Linda Revilla, PhD and Sarah Miyahira, PhD

The Pacific Islands Division became the newest member of the National Center for PTSD in 1993. It is located at the Honolulu VAM&ROC, under the leadership of Acting Director Sarah Miyahira, PhD. The Division actively seeks to contribute to the knowledge and understanding of ethnocultural factors and PTSD; it collaborates with the Department of Defense on PTSD issues related to active-duty personnel and their dependents; and it seeks to improve access to PTSD treatment in geographically remote and/or distant areas. In keeping with these goals, several Division research projects emphasize the participation of Asian American and Pacific Islanders in research protocols and devote significant amounts of resources to community outreach. In 1993 the Division joined with the University of Hawaii and the World Health Organization to co-sponsor an international conference, "Ethnocultural Aspects of Trauma and Post-Traumatic Stress."

Edward Kubany, PhD, is one of two researchers who have been associated with the Division since its inception. Recently, Dr. Kubany completed his VA Merit Review project, "Cross Validation of a Trauma Related Guilt Scale." Dr. Kubany also completed validation studies of the Traumatic Life Events Questionnaire and the Distressing Event Questionnaire. More recently Dr. Kubany, in collaboration with LTC Elizabeth Hill, D.N.Sc., Tripler Army Medical Center, received a DoD Triservice Nursing Program grant to conduct a controlled clinical trial of Cognitive Trauma Therapy with 120 battered women suffering from PTSD.

Chalsa Loo, PhD, also joined the Division when it was established. Currently, she is working on a VA Merit Review project, "Race Related Experiences Scale for Asian American Veterans." This is a scale construction validation study of a screening instrument for assessing race-related events stress experienced by Asian Americans during the Vietnam War. Another objective of the study is to determine whether race-related stress or trauma has an additive effect over and above the effects of combat on PTSD or other psychological dysfunction. Several new questionnaires and assessment measures have been developed.

Stefan Bracha, MD, is a research psychiatrist whose affiliation with the Division began in 1995. With funding from the National Alliance for Mentally Ill Stanley Foundation, Dr. Bracha has established a laboratory to examine dental enamel in an effort to identify a new biological marker in PTSD. This marker may be useful in quantifying pre-military stressors in combat-related PTSD. In addition, this marker may have promise in quantifying trauma in children and adolescents and in quantifying etiological factors predicting treatment response.

Claude Chemtob, PhD, joined the Division in 1997. His current research interests include the impact of natural disasters and domestic violence on children and adults and information-processing models of PTSD. Work in this latter area includes empirical and theoretical development of a neuropsychological model of PTSD. Most recently, Dr. Chemtob has initiated a collaboration with Jack Carlson, PhD (University of Hawaii), Ray Novaco, PhD (University of California, Irvine), and David Riggs, PhD (Behavioral Sciences Division, National Center for PTSD) to further develop anger treatment for patients with PTSD.

The Division also focuses on program evaluation. Antonio Gino, PhD, has developed an electronic database to collect PTSD assessment and other clinical data as well as to extract relevant patient information from the VA Decentralized Hospital Computer Program (DHCP). It is anticipated that the database will eventually be useful to conduct treatment outcome studies, to establish psychological test validity for different ethnic groups, and to engage in other types of research projects.

Additionally, the Division served as the PTSD representative for the Honolulu VAM&ROC and collaborated with other VAMC researchers in developing a proposal to establish a Mental Illness Research, Education, and Clinical Center in the Sierra-Pacific Network (VISN 21). Currently, the Division is collaborating with the Department of Defense in the Pacific through a telemedicine research proposal on PTSD assessment and clinical consultation.

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PILOTS UPDATE

The PILOTS database is our primary bibliographical product, but it is not our only one. Several of our publications are derived from our work on the database, and we are always looking for new ways to increase the return on our bibliographical investment.

One of the first spinoffs from the database was the *PILOTS Database Instruments Authority List*. This was begun as a way of ensuring that, in our lists of the assessment instruments used in the research and clinical studies that we index, consistent names are used for those instruments. To help our indexers distinguish among similarly-named instruments, we began to add limited bibliographical information to the list. For the same reason, we sometimes added a brief description of the nature of the instrument. Over the years the number of instruments, and the information about them, has increased to the point where our *Authority List* has become a substantial bibliography of nearly 150 pages. As such, it may have uses beyond its original purpose as a reference aid for the PILOTS database indexing staff. Anyone wishing to obtain a copy may order one from the National Technical Information Service (PB98-116825; domestic price $35, paper; $14, microfiche) or download a free copy from our Web site.

Another series of bibliographic publications derived (at least in part) from the PILOTS database is the *PTSD Research Quarterly* itself. We work closely with contributors, providing searches of the database and other bibliographic assistance. The abstracts that accompany these articles are usually taken from the database, and we use it and the PTSD Resource Center's collection to verify the bibliographical data our contributors send us. This helps us to make each *Research Quarterly* article a valuable selective guide to the literature of its topic.

The goal of the *PTSD Research Quarterly* is to disseminate timely information on traumatic stress research to academic scientists and mental health professionals. Its content is not easily accessible to non-professional readers, from whom we receive many requests for information on various aspects of PTSD. To satisfy their information needs, we have produced a series of Fact Sheets. These brief explanations of traumatic stress topics for lay readers are limited in size to a single sheet of paper. When appropriate, suggestions for further reading are provided.

Some of our Fact Sheets are distilled from survey articles in the *PTSD Research Quarterly*; others are drafted by National Center staff members. In either case, the collections of our PTSD Resource Center are available to those preparing them, and the PILOTS database is heavily used in the editorial process. This helps us to meet our goal of providing reliable, authoritative information to veterans and their families, trauma survivors, students, and others interested in the psychological consequences of traumatic experiences.

We have recently produced our first National Center Clinician's Update. This new series is intended to offer brief, timely, reliable surveys to mental health practitioners and to the primary care physicians who increasingly are serving as the point of entry to mental health care for their patients. They supplement our existing clinical publications by allowing us to distribute information that does not fit into the *NC-PTSD Clinical Quarterly*'s format or publication schedule.

All of our Fact Sheets and Clinician's Updates are available on our Web site. Like our other Web resources, they may freely be reproduced and distributed.

Both Fact Sheets and Clinician's Updates can be produced rapidly. During the Red River floods we were asked by mental health authorities in North Dakota for information to be distributed to flood survivors, disaster workers, and counselors. We had three fact sheets available within 48-hours, and in the aftermath of subsequent disasters we were able to respond immediately to requests for informational material. Our Web site makes it possible for those in need to have access to our publications without waiting for our reply to an urgent telephone call, email, or fax message.

When we began our bibliographical work, our hope was to provide a useful service to researchers and clinicians. This we have done. The usage figures that we receive from the Dartmouth College Libraries show a high number of connections to the database each month, and visitors to National Center headquarters in White River Junction give us a qualitative idea of its value to traumatic stress workers. By leveraging the work we put into PILOTS we are beginning to make a similar impact on a broader public.

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