

# Posttraumatic Stress Disorder and Motor Vehicle Accidents: A Multidisciplinary Overview

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**Objective:** Motor vehicle accidents (MVA) may result in intractable disability. This paper investigates posttraumatic stress disorder (PTSD) as a potential cause.

**Method:** The literature was reviewed for recent studies on prevalence, symptom profile, and outcome of PTSD.

**Results:** PTSD is prevalent in roughly 10% of survivors of MVAs during the first year. Comorbid depression and pain are common. Medical complications, psychophysiological reactivity, and possibly litigation may slow remission. Phobic symptoms can persist for years. Mood disturbance may augment the impact of pain on daily living and on self-perceived disability.

**Conclusion:** Recently developed screening instruments, structured interviews, and behavioural approach tests yield quantitative and reliable assessments of symptom severity. Cognitive-behavioural intervention and antidepressants may improve coping, ease fear, and reduce the impact of pain.

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**Key Words:** accidents, phobias, pain, assessment, disability, treatment

An MVA is a human-made calamity. It angers and it raises questions of blame. It can turn survivors into white-knuckled drivers who live in fear of another accident (1). Medical help is more likely to be sought for physical complaints than for emotional distress (2). Somatization (3), comorbid conversion disorder (4), and pain may further obscure core symptoms of PTSD. Rehabilitation attempts of patients with unrecognized PTSD are frequently disappointing (5). A common presentation is "whiplash neurosis," a combination of spinal pain and fear (6). Functional pain behaviours, observed during neurological examination in distressed patients (7), may trigger a mental health referral even though fears remain undisclosed. Chronicity is common and often exceeds 3 years, as exemplified by the patients sampled by clinical studies (7-11).

Accident phobia and PTSD are frequently disabling (12,13). In a mild case, phobic anxiety transforms travel from

an enjoyable ride to a journey endured with dread. In a severe case, road travel is restricted to essential journeys and select driving conditions. Insomnia, nightmares, intrusive recollections of the accident, panic, depression, fatigue, and comorbid chronic pain bar a return to normal living. Patients reorganize their lives to accommodate their fears, change their residence and/or job location, and give up leisure travel. Normal living may be disrupted to a degree equal to that of severe physical handicap (9). Complete driving avoidance, however, is rare (13,14).

## Prevalence

A prospective emergency room study identified an acute stress syndrome in close to one-fifth of MVA survivors. During the following year, symptoms tended to improve. PTSD persisted in roughly 10%, and fears of being a passenger remained for over 16% (12). A survey of subjects from a police register identified complaints suggestive of PTSD in approximately 10% of accident victims (15). A government survey identified driving fears, not clinically diagnosed phobias, in 19% of MVA survivors (16). PTSD is more prevalent in those who seek treatment than in the subjects of these nonclinical surveys. At a pain clinic, phobias and PTSD were 3 times more common in MVA survivors than in subjects with a nonvehicular onset of pain (10). The prevalence of accident phobia and full-blown PTSD was close to 40% in 4 samples of treatment seekers with chronic symptoms (8,10,11,14).

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PTSD may remit, completely or in part. In one follow-up study of acute cases, 54% no longer met full diagnostic criteria after 6 months, and 64% with partial PTSD achieved remission. Avoidance and numbing symptoms declined, though hyperarousal persisted (17). The prospective emergency room study observed a decline in the prevalence of driving fears from 22% three months after the MVA to 16% after one year. Unresolved medical complications were associated with persistent symptoms of PTSD (12). In a third study, accident-related phobic anxiety persisted for 4 to 6 years after the MVA in one-third of the respondents (18). More severe and more numerous symptoms during the acute phase of PTSD predicted chronic PTSD one year later (12,17).

### *Causation*

The cause of PTSD is best described in multifactorial terms. Prevalence (10,12,14) and the specificity of learned fear (11) support the theory that MVAs can cause PTSD. Classical (Pavlovian) conditioning combined with operant learning offers a theoretical model for acquisition and persistence of fear (19). Three observations lend further support to this theory. First, heart rate reactivity to audiotaped reminders of MVA is associated closely with PTSD-related psychopathology and with nonremission (20). Avoidant coping accounts for 41% of intrusion scores on a PTSD scale (21). Amnesia caused by concussion appears to protect against specific MVA-related travel fears (12,22). A simple dose-response relationship between MVA and resulting psychopathology, however, has not been demonstrated. Premorbid "vulnerability" likely contributes to psychopathology. The development of PTSD is associated with a history of other traumas, including depression (14), anxiety disorder (10,13), and headache (23), but not with a history of an MVA (13,14). Past psychiatric illness may precede the onset of MVA-induced PTSD in 50% of cases or more (13). Psychological reaction to the experience of a crash may depend more on subjective perception than objective damages (24). From the perspective of rehabilitation, factors that perpetuate chronic PTSD matter even more than initial cause. Persistent physical impairment, for example, may slow remission of PTSD (12,17). Concurrent litigation was associated with persistent PTSD according to 2 studies (17,21), but not according to a third (12).

### *Effects of Comorbidity*

Patients with muscle contraction headache are sensitive to stressful stimuli (25). Mood disturbance augments both the impact of myofascial pain on daily activities (26) and the self-perceived disability attributed to headache (27). In a study of generalized myofascial pain, severity of anxiety and depression accounted for approximately 25% of the variance in self-reported impact of illness and physician-rated disability (28). A longitudinal study of pain complaints found similar associations (29). These findings apply primarily to myofascial pains, not to all types of pain disorder.

### **Differential Diagnosis**

According to a cluster analysis of complaints reported 2 to 60 months after the MVAs, depression outnumbered PTSD by 3 to 1. Less distinct clusters were maladaptation to pain and postconcussion syndrome (30). Depression is less common according to other studies, which found that comorbid depression occurred in 10% (12), 41% (13), and 53% (14) of subjects with persistent PTSD. Adjustment disorder should be considered in the differential diagnosis of patients whose symptoms do not meet PTSD diagnostic criteria and whose impairment is disproportionate to the stressor (31). The onset of panic disorder is associated with loss events (32). We see a subtle but important difference between a loss and the "nervous shock" of psychological trauma as defined by DSM-IV (31). Most agoraphobic driving fears result from unexpected panic attacks on the highway, not from accidents. Only 15% to 20% of driving fears develop after a collision (33,34). Agoraphobic driving fears also differ clinically from accident phobia. Agoraphobic panickers fear losing control over their vehicle in the event of a panic attack. Accident phobics fear MVAs excessively and assess the risk of traffic situations abnormally (8,11,13). Occasionally, PTSD-related anxiety symptoms are associated with the experience of hospitalization, not to the MVA itself (35).

Postconcussional disorder should be ruled out through appropriate testing and neurological consultation when complaints include head injury, headache, amnesia of the MVA, difficulty learning new information, and poor ability to focus attention (36). Brain injury is associated with early onset of post-MVA depression. Late-onset depression is associated with psychosocial factors (37). Neuropsychological testing may be helpful even if brain damage has already been confirmed. Testing can assess current function and lead to recommendations for rehabilitation. A complaint of "unconsciousness" after the MVA, sometimes voiced years later, must not be accepted uncritically. Survivors who panicked during the crash may mislabel faintness and dissociation, symptoms that are part of an acute stress syndrome (13). "Postconcussive" complaints may not amount to measurable impairment. In one study, neuropsychological test results were similar in subjects with mild head injury, both with and without postconcussional symptoms, and in healthy controls (38). Effects of central nervous system depressants and sleep apnea should be ruled out in patients with symptoms of unclear etiology (39).

### *Medicolegal Aspects*

When survivors of MVAs take legal action to prove damages, they have 3 rivers to cross: Are they suffering from a diagnosable disorder? Does the disorder cause demonstrable disability? Was the MVA cause or occasion for the disability? To be credible, a medicolegal report should describe, not advocate. Guidelines are readily available (40,41). Alternative causes for apparent PTSD should be considered (42). The severity of the patient's symptoms and their impact on daily living should be assessed in quantitative terms before

Table I			
Accident Fear Questionnaire <sup>a</sup>			
The following questions are about your motor vehicle accident and your reactions to it. This questionnaire only applies to you, if you remember the accident.			
	YES	NO	
1. During the accident did you fear for your life?			
2. During the accident did you see anyone injured or killed?			
3. During the accident did you lose consciousness?			
4. Do you have nightmares about the accident?			
5. Are you nervous before trips?			
6. Do you easily get upset in the car?			
7. Do you tell the driver what to do?			
8. Do you drive less than you used to?			
9. Do you expect another accident soon?			
10. Would most people feel after an accident the way you do?			
Instructions: How much do you avoid the situations listed below because of fear or distress? For each question, please pick a number from the scale below to show how much you avoid the situation. Then write the number on the line opposite the situation.			
0	1	2	3
4	5	6	7
8			
Would not avoid it	Would sometimes avoid it	Would often avoid it	Would always avoid it
Since your accident, do you avoid:			
11. Driving as a passenger			
12. Driving yourself			
13. Riding in a particular seat			
14. Driving on certain roads			
15. Riding with certain drivers			
16. Driving in certain weather conditions			
17. Hearing news of accidents			
18. Seeing wounds and injuries			
19. Crossing streets alone			
20. Riding a bus or streetcar			

<sup>a</sup>Reprinted from reference 13 with permission from Elsevier Science LTD, Pergamon Imprint, The Boulevard, Langford Lane, Kidlington OX5 1GB, UK.

disability is endorsed. The level of pre-MVA adjustment is crucial in differentiating the subtleties that separate a “thin-skulled client” (the vulnerable individual who managed to cope with symptoms before the MVA and decompensated after the MVA) from the client who has frequently felt overwhelmed by the demands of normal living even before the MVA.

An MVA survivor’s complaints may be amplified by anger and hostility (43). In treatment seekers, malingering is of little concern. In medicolegal cases, it is of great concern when plaintiffs misrepresent their current daily activities. Structured clinical interviews for inconsistent symptoms (44) and subscales in the Minnesota Multiphasic Personality Inventory (MMPI-2) (45) have been developed to detect malin-

gering. Malingering should not be assumed without solid proof. Follow-up studies of settled claims demonstrate little or no effect of the settlement on subsequent complaints and return to work (46–48).

Functional complaints may be reinforced inadvertently by clinicians interested in a particular disease and by fashion (49). A diagnosis of PTSD made in this context is dubious when the putative victim had a degree of control over his exposure to the stressor or was not exposed directly. A retrospective study of other ferry crew after the Herald of Free Enterprise disaster may serve as an example. Three years after the accident, crew presented with symptoms of PTSD, having had no direct contact with the disaster, with bereaved relatives, or with rescuers (50).

**Assessment**

Screening questionnaires for PTSD (51,52) may precede or supplement a diagnostic interview. The Accident Fear Questionnaire (13) discriminates among PTSD, accident phobia, and non-PTSD and may serve as an outcome measure (Table I). Trauma cases must be screened for persistent pain. A convenient test involves shading painful areas on a body silhouette (53). For diagnostic interviewing, we recommend a semistructured review of symptoms, with reference to DSM diagnostic criteria to assure completeness. Fully structured interviews are recommended when a premium is placed on the reliability of DSM diagnoses. Examples are the structured interview for DSM (54) and the Clinician-Administered PTSD Scale (55). The latter has the advantage of offering a severity score.

Relatives and friends of the patient may have important observations to offer on phobic avoidance, on driving behaviour, and on excessive concerns over safety. As an office procedure, accident-related phobic anxiety may be deliberately evoked by exposure to reminders of the MVA. Exposure may be imaginary (1) or enhanced by audiotape (20) or in vivo exposure to traffic (56). The last method delivers a more potent stimulus and allows first-hand appraisal of fearfulness, startle response, increased pulse rate, tremor, sweating, and phobic avoidance (56).

**Management**

In general, treatment of PTSD with antidepressants and benzodiazepines has met with modest success (57). Behavioural techniques involving therapeutic exposure appear to fare somewhat better (58). For example, rape survivors who displayed the most fear and the least anger fared better in treatment than rape survivors with the reverse combination (59). Eye-movement desensitization has been suggested as an elaboration on imaginary desensitization (60). Some Vietnam veterans have reacted to exposure therapy with exacerbation of depression, relapse of alcoholism, and precipitation of panic disorder (61). Psychodynamic therapy and hypnotherapy hold promise (58), although worsening of symptoms has

been observed with uncovering techniques in MVA survivors (Blanchard, unpublished data).

So far, no randomized or controlled treatment studies of MVA-related PTSD have been published. Case studies outline behavioural procedures (1,56,62,63). Cognitive intervention may address abnormal risk assessment. Imaginary exposure may succeed when visual recall of the MVA evokes a strong emotional response (1). In vivo exposure is best conducted with the patient riding in the car as a passenger, the ride continuing until fear and the urge to terminate the drive have been extinguished and excessive startle no longer interferes with safe driving. A fair trial of exposure therapy requires approximately 4 sessions lasting 3 hours each (56). Focused relaxation may be a useful adjunct (63).

Chronic pain is best treated as a multifactorial disorder with a medical, a psychiatric, and a behavioural component. Psychiatrists may assist a multidisciplinary team by treating the psychiatric disorder, advising on psychotropic agents, and offering cognitive-behavioural intervention (64,65). Treatment of PTSD eliminates pain only rarely, but it improves "damage control" by reducing the destructive interactions among anxiety, depression, and pain. Cognitive therapy discriminates between pain in the narrow, neurological sense and suffering in the wider, psychological sense. Suffering depends on mood, fear, and outlook (66). Antidepressants may have analgesic properties (67). Low-dose amitriptyline, for example, may be more effective in treating chronic pain than nondirective psychotherapy (68), but some selective serotonin reuptake inhibitor antidepressants, such as trazodone, may not provide analgesia (69). For PTSD, depression, and pain alike, restoration of an acceptable life style is the ultimate goal. Reactivity to reminders for PTSD, phobic avoidance, and impaired mobility may serve as outcome measures and give direction and consistency to the treatment of a sometimes perplexing condition.

#### Clinical Implications

- MVA-related PTSD and disability are common. Ask MVA survivors about anxiety, nightmares, and phobias.
- Comorbidity of anxiety, depression, and pain are common after MVA. Ask survivors about physical symptoms.
- A detailed review of the impact of illness on daily activity is essential for disability assessment and rehabilitation. A number of clinical scales and the accident fear inventory will yield quantitative outcome data.

#### Limitations

- Some patients may magnify their complaints, and independent observation may be required for a reliable assessment.
- No definitive dose-response relationship between MVA and PTSD has been identified.
- Controlled treatment studies of PTSD after MVA are lacking.

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### Résumé

**Objectif :** Les accidents d'automobile peuvent déboucher sur un handicap irréductible. Le présent article s'efforce de déterminer si le syndrome du stress posttraumatique (SSPT) fait partie des causes éventuelles du problème.

**Méthode :** On a dépouillé la documentation pour trouver des études récentes sur la prévalence, la symptomatologie et les issues du SSPT.

**Résultat :** Le SSPT n'est prévalent que chez environ 10% des survivants d'un accident d'automobile, la première année. La dépression et les douleurs sont souvent concomitantes. Des complications médicales, des réactions psychosomatiques, même les poursuites judiciaires peuvent freiner la rémission. Les symptômes de phobie persistent parfois de nombreuses années. Les troubles de l'humeur peuvent aggraver les effets de la douleur dans la vie quotidienne et la perception du handicap par le sujet.

**Conclusion :** De nouveaux instruments de dépistage, des interviews structurées et des épreuves comportementales donnent une évaluation quantitative fiable de la gravité des symptômes. Une intervention cognitive-comportementale et l'administration d'antidépresseurs pourraient aider les intéressés à s'adapter, à apaiser leurs craintes et à moins ressentir les effets de la douleur.