

AN OBJECTIVE
STUDY OF
THE WHIPLASH VICTIM
AND
THE COMPENSATION SYNDROME

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- FOREWORD -

"... If this writ had been issued promptly ... and the action had been pursued with ordinary diligence by the Plaintiff, I think that this case would certainly have come on for trial early in 1965. If it had come on early in 1965, the Plaintiff would, in my view, very soon thereafter have been back in his old job as a carpenter, and a very much happier man than he is today ... I have no doubt that if the action had been tried in January 1965, as it should have been, instead of some three and one-half years later, the Plaintiff would very soon have been back at work."

The above quotation provides a classic illustration of the "compensation syndrome", or "litigation syndrome". Mr. Justice Salmon was discussing the plight of the Plaintiff, a carpenter and joiner, who, during the month of March, 1962 fell about thirty feet owing to the negligence of the defendants, his employers. The Plaintiff suffered severe pain in the head, back, leg, arms and neck from the time of the accident onwards. No physical cause could be found for this pain, and it was the opinion of the Plaintiff's neurosurgeons that his suffering was brought about by anxiety over the accident and a functional overlay. The Plaintiff's lawsuit was not instituted until some two years after the initial injury. There was a further delay of four years, the trial of the action finally taking place during the month the June, 1968. The Trial Judge awarded the Plaintiff L 11,267. damages, but this was reduced to L 4,500. on appeal.

Mr. Justice Salmon was merely stating overtly what many members of the judiciary may have thought but not so forcefully articulated; that the pain and suffering and general malaise that afflicts so many litigants and claimants will often subside, to a greater or lesser degree, depending upon the individual's circumstances, upon actual payment of a damage award. This is a theory that appears to be whole-heartedly embraced by defendant's lawyers, insurance adjusters, members of administrative tribunals, and numerous other professionals who are engaged in the assessment of damage awards. It is a theory that frequently bedeviled me during the period that I was actively engaged in practice before the courts because it seemed to me to be highly suppositious. The study that follows is an attempt to examine this theory in a scientific manner.

This research project (and I suppose many others whose genesis is not set forth in learned periodical journals) was conceived at a cocktail party. I was engrossed in a conversation with Dr. Morgan Wright, a clinical psychologist, and our host, a judge and former trial lawyer, when the discussion turned to the compensation syndrome. I expounded my views, and a suitable challenge was thrown out, resulting in Dr. Wright and myself joining forces in an effort to assess the validity of the compensation theory. Some five years transpired from inception to completion.

1. **James v. Woodall Duckham Construction Co. Ltd.**, (1969) 4 All E.R., 794, (English Court of Appeal), Salmon, L.J., at 797.

This project would not have been possible without the utilization of the resources of the Legal Research Institute of the Faculty of Law of the University of Manitoba. The Canada Council, the Donner Foundation, the Insurance Bureau of Canada, and the Faculty of Graduate Studies of the University of Manitoba provided the necessary financial wherewithal for the hiring of research assistants. The contributions of Mr. Leo Wenden, Mr. Peter Oreck, Mr. Delbert Plett, Mr. William Hechter and Mr. William Stevens our research assistants, are gratefully acknowledged. Dr. Alex Guttman and Dr. David Bruser, two orthopedic surgeons practising in Winnipeg, helped us to gain valuable insights into some of the medical perplexities confronting us. Our prime group of research subjects were those who had sustained "soft tissue" injuries, those that manifest themselves mainly by way of subjective, rather than clinically diagnosable complaints. We are much indebted to all the interviewees, who unstintingly and unselfishly gave of their time. Mr. Lou Rodkin and the computer department of Red River Community College were most helpful in compiling the statistical data. Finally, I would be sadly remiss if I did not make specific mention of my wife Doris, whose administrative and interviewing capabilities came to the forefront during the implementation and completion of this project.

A.B. Bass

INTRODUCTION

Controversy surrounds almost all aspects of whiplash injuries including the legitimacy of the term itself. Opinion, both medical and legal, is sharply divided as to whether "whiplash" victims suffer from a physical injury or an emotional reaction — and, if the latter, whether the emotionally generated symptoms are related to the desire for financial compensation or are due to the traumatic nature of the accident itself. In the research that follows, the authors studied 120 whiplash victims with the aim of trying to weigh these factors as they contribute to the whiplash picture. The problem is not new, and other studies have addressed themselves to it. However, to the authors' knowledge, no investigator has employed psychological tests in their investigations*, nor has there been a systematic attempt to evaluate such subjects prior to and following litigation.

The research project was initiated by the Faculty of Law at the University of Manitoba, with the methodology and data analysis provided by members of the Department of Psychology. The bulk of the actual interviewing and test administration was carried out by Law students, while a review of the literature was provided by a graduate psychology student.

The order of presentation will be:

- (1) A brief review of whiplash injury research.
- (2) methodology employed in this study.
- (3) the results of whiplash subjects tested and interviewed before and after litigation.
- (4) a discussion of the results.
- (5) follow up interviews with selected whiplash subjects by Dr. Wright.
- (6) Concluding remarks and summary of findings.
- (7) The legal implications of the findings.
- (8) References.
- (9) Appendices.

PART I

Selected Review of Whiplash Research

The following review makes no claim to being comprehensive, particularly in the area of physical findings. Its purpose is to acquaint the reader with some of the major considerations related to the cause and effects of whiplash injuries, with particular attention paid to psychological factors.

WHIPLASH INJURY — HOAX OR SYNDROME?

The terms "whiplash" and "whiplash injury" appear to have originated in 1928, when Dr. Harold E. Crowe,² of Los Angeles, used it at a meeting of the Western Orthopedic Association in San Francisco. At the time, Crowe was reporting on eight patients who were responding poorly to treatment for injuries in the cervical area which they had incurred in automobile accidents. Although the term "whiplash" was not applied to such injuries until this time, they had been detected as early as World War I, when the

* de Gravelles & Kelly (1969) did use a short six item test, which will be described.

2. No. 9. Numbers refer to works listed numerically in Part viii - References

U.S. Navy began catapulting planes from the decks of battleships and cruisers.³ Shoulder harnesses were installed at that time to prevent injuries to the pilot. The same steps were not taken until approximately 50 years later to protect the drivers of cars.

A number of authors have objected to the term 'whiplash' for one of two reasons: (1) it is viewed as being a meaningless term and therefore as irrelevant in terms of understanding the injury, and/or (2) they believe that it leads to fraudulent claims, possibly even convincing patients of imaginary ills. Authors of this persuasion see the term as not only a hoax, but a mischievous hoax. In the hands of a persuasive lawyer, it lends itself to histrionic embellishment as the jury follows the course of the client's head and neck as it snaps back two or three feet and then forward. Not only may the term mislead the judiciary, but the accident victim may also become demoralized by the abnormal fears associated with the term, and thus have his symptoms prolonged on an emotional basis.

From a historical point of view, Snow⁵ points out that there have been other popular injuries in days gone by that were the cause of innumerable litigation. Thirty years ago it was an injury called the sacroiliac spread or slip, or the claim of Jacksonian epilepsy as a consequence of an automobile accident, that consumed the court's time. Whiplash injuries have taken over from these previous "traumas", being admirably suited for the purpose because of its name and the difficulty, if not impossibility, of proving that it is not a reality for a given claimant.

Not all investigations are critical of the term. Seletz,⁶ for instance, believes it be both accurate and legitimate in describing a physical trauma and asks his colleagues to recognize it and use it as such.

WHIPLASH INJURY — CAUSES

Macnab⁷ has reviewed the effects of varying impacts on the occupants of the struck car. It seems that the greatest amount of damage is done to the victims' necks when the following car is travelling at an intermediate speed rather than at a very low or very high speed. If the impact is even 15 m.p.h. the force of the impact may be as high as 100 pounds. In impacts up to this speed, the front right seat passenger is more liable to be injured than the driver, since it is possible for the driver to brace himself by holding on to the steering wheel. The steering wheel ceases to provide any such protection at slightly higher speeds, however, as it prevents the driver from slipping forward and reducing the strain on the neck. Seat belts may also aggravate the injury at speeds over 20 miles per hour as they prevent the forward movement of the trunk. Higher impact collisions may also reduce the likelihood of a whiplash injury as the greater force against the seat may collapse it, leaving the victim in an almost horizontal position.

Macnab⁸ points out that the severity of injury depends upon the rate of acceleration rather than other factors such as the distance the car was propelled. The rate of acceleration depends on the force applied and the resistance to acceleration of the struck vehicle. The force applied depends upon the weight and velocity of the striking vehicle, while the resistance to

3. No. 19.

4. Nos. 3, 4, 6, 10, 12, 14.

5. No. 39.

6. No. 38.

7. No. 27.

acceleration depends upon a number of factors such as the weight of the vehicle being struck, the road conditions, whether the brakes were applied, whether the car was in gear, the type of transmission, etc. As a result, there is little correlation between the damage sustained by the car and the injuries sustained by the occupants.

The actual mechanics of the injury need not concern us here, the reader being referred to expert sources⁸ for this information. However, it is of interest to note that there is evidence⁹ to suggest that when people are facing the back of the car in a rear-end collision, or when a car is struck from the side, there is less likelihood of debilitating physical symptoms. As the author points out, such data puts claims of "litigation neurosis" in a questionable light, since it seems that people rarely become neurotic if their heads are thrown forward or sideward in accidents, while they are said to do so when their heads are thrown backward.

WHIPLASH INJURY — PHYSICAL SYMPTOMS

One of the baffling features of a whiplash injury is that pains may not be present for some time following the accident. Some authors describe symptoms, particularly neck pain, as being immediately experienced in rear-end collisions; however, many others¹² report their observations to be that symptoms may be mild or minimal at first and then worsen. Certainly neck symptoms are a frequently reported complaint, but are apparently not invariable. The incidence, in the literature reviewed, varied from 60 to 100¹³ percent. In one study¹⁴ of 137 patients, two thirds of the victims developed neck pain immediately following the accident and 24 percent developed symptoms within one or two days after the accident. Headache, often occipital, appears to be another common symptom in whiplash injuries, the incidence being close to 30 percent. Investigators¹⁵ have demonstrated that the rotational displacement of a child's or rhesus monkey's head or the neck alone without direct head impact, produces gross hemorrhages and contusions over the surface of the brain and upper cervical cord, suggesting the possibility of analagous injuries to humans under similar conditions.

Many authors¹⁶ believe that there is a relationship between the severity of the injury and the distribution of pain in the upper extremities; the more severe the injury, the greater the probability of upper extremity involvement. Specifically, in one study¹⁷ 13% of the patients reported numbness in their arm or hand, in another,¹⁸ 10% reported immediate numbness in their arm or hand, with almost all developing the symptom eventually. Purviance¹⁹ found only 2.5% of his cases reported pain involving the upper extremity, with 42.5% reporting delayed pain.

8. *Ibid.*

9. Nos. 12, 35.

10. No. 28.

11. Nos. 5, 14, 22, 42.

12. Nos. 5, 12, 13, 15, 16, 30.

13. Nos. 12, 23, 26, 37.

14. No. 12.

15. Nos. 17, 34.

16. Nos. 2, 42.

17. No. 12.

18. No. 41.

19. No. 35.

McOsker²⁰ found 13% of his subjects reported radiation into one or both arms; James and Hamel²¹ found radiation of pain into the shoulders reported by 46% of their subjects.

Though not always mentioned, lower back pain is occasionally listed as a symptom reported by victims of rear-end collisions. de Gravelles and Kelly²² list a number of authors whose subjects complained of lower back pain. In their own study, they found that 34.6% reported this symptom, following the accident, though not immediately in all cases.

Macnab²³ states that dysphagia, or trouble in swallowing, is probably a result of one of two causes: pharyngeal edema or retropharyngeal hematoma. He feels that the early onset of dysphagia is of serious prognostic significance and that if it occurs several weeks after the accident, it is likely to be functional in origin. This appears to be a relatively uncommon symptom if one can judge its occurrence in terms of its frequency in the literature.

Blurring of vision seems to be a more commonly occurring symptom in whiplash cases. deGravelles and Kelley had no question concerning blurred vision in their study, but they mention that Russell²⁴ reported its occurrence affecting some of his subjects. Coppola²⁵ mentions it as being a common occurrence, while Schutt and Dohir²⁶ state that only one of 74 of their patients reported "visual difficulties". Macnab²⁷ attributes blurred vision to damage to the vertebral artery or damage to the cervical sympathetic chain. He states that blurring of vision alone is "of no prognostic significance, but if associated with facial paralysis, it indicates a serious soft tissue injury."

WHIPLASH INJURIES — PSYCHOLOGICAL ASPECTS

Many factors are believed related to the high incidence of emotional symptoms arising out of whiplash injuries. Frankel,²⁸ as noted, has indicated how the term is tailor-made for the histrionic lawyer, and by implication, indicates how it lends itself to the "compensation syndrome" — symptoms maintained presumably until the litigation is finished. Threadgill²⁹ believes that the abnormal fear engendered in the public's mind by the term is responsible for the prolongation of symptoms.

Gooten³⁰ was impressed by the presence of emotional symptoms in a study of 100 cases of whiplash injuries. In some cases he suggested that the patient uses his accident as a convenient lever for personal gain, in implementing psychological adjustments that had been previously postponed, (divorce, job change), or in obtaining recognition from members of the family or securing attention from neighbours. He did not feel that such actions were necessarily dictated by conscious decisions, however the symptoms were used to achieve gains for the victim and so were reluctantly given up. The extent of the emotional component depended to a

20. No. 31.

21. No. 23.

22. No. 12.

23. No. 28.

24. No. 36.

25. No. 8.

26. No. 37.

27. No. 28.

28. No. 14.

29. No. 40.

30. No. 16.

great extent on the personality of the patient as well as the degree of his physical injury. Once developed, psychoneurotic symptoms were refractory to treatment, being resolved only by the settlement of the litigation.

A different point is made by Guy³¹ who describes himself as "a lawyer specializing in the management of personal injury cases". He is skeptical of injuries supposedly caused by minimal impacts. He is convinced that a genuine whiplash injury only occurs when there is a pre-existing condition. It is his "intuitive thesis" that incipient or actual osteo-arthritis changes must be present prior to the injury for a genuine whiplash injury to occur. It is the re-destruction and the reforming of scar tissue that is responsible for the continuing pain, rather than the stretching of healthy tissue. By implication then, prolonged physical symptoms following a whiplash accident, are emotional in origin unless a physical precondition exists.

Not all authors agree with the concept of a traumatic or litigation neurosis as an explanation for the high incidence of physical and emotional symptoms following a whiplash injury.

Schutt and Dohir after examining neck injuries to women in auto accidents in metropolitan regions, are not impressed by either malingering or subconscious psychoneurotic mechanisms in people seeking financial compensation. Likewise, Acres³² points out that 'Not all patients with pains in the neck are neurotics, and not all pains in the neck are relieved by settlement of litigation'. Macnab³³ draws our attention to the fact that it seems to be only the neck that is involved in "litigation neurosis", despite the fact that people suffer from many other injuries at the same time. If the critical explanatory mechanisms for the whiplash victim symptoms were psychological, then why would not comparable symptoms develop with other traumatized parts of the body? In support of this, he reports that of 69 passengers sitting sideways, only 7 suffered pain after being involved in an accident, and only 2 still having complaints after 2 months.

However the question still remains, why the high incidence of emotional symptoms following a whiplash injury even after the litigation? Hodge³⁴ provides a theoretical answer. It is his belief that the circumstances surrounding such injuries are ideally suited to the development of a traumatic neurosis. Using an analytic psychological model, he theorizes that in normal adjustment anxiety serves to alert the ego to danger, mobilize psychic energy in the defense of the ego, and then discharges psychic energy through appropriate defensive actions. Upon the ego handling the stress, anxiety and tension are discharged and equilibrium restored. What is crucial in the development of a traumatic neurosis (as in whiplash injury) is that the ego passively experiences the stress without anxiety — anxiety only being mobilized *after* the accident, when it is too late to initiate "fight or flight" behaviour. This in turn produces a state of generalized anxiety — "Something did happen" implies that "Something can happen" and therefore "Something might happen". It could be *anything*, and this leads to generalized anxiety.

On this basis many of the symptoms such as insomnia (fear of becoming defenceless), projection (defence against anger at self), etc. can

31. No. 18.

32. No. 1.

33. No. 29.

34. No. 20.

be explained. Added to this picture are accident-produced physical symptoms, which are needed to maintain the equilibrium involved in this new way of viewing oneself, as vulnerable and wronged, being therefore resistant to change once the physical basis has gone.

The above explanation may be correct, however, it fails to explain Macnab's³⁵ observation that other injuries incurred in the same accident seem to heal more quickly than those associated with the neck, or the fact that many accidents have the element of surprise (falling of a ladder, slipping on a wet floor) without the frequency of the same dire psychological consequences. However, it does provide a hypothesis for the uniquely traumatizing aspects of a whiplash injury, including such symptoms as insomnia and generalized anxiety. deGravelles and Kelly in their study attempted to deal with the "neurotic" component of the subjects response to his whiplash injury by using a test of neuroticism. The test used by deGravelles and Kelly was made up of six items as follows:

- Do you often have trouble getting to sleep at night?
- Do you often feel tired when you get up in the morning?
- Do you have to watch your health carefully or you will get sick?
- Do things go wrong for no fault of your own?
- Do you think you are a nervous person?
- Do you worry a lot over things that might happen to you?

On the basis of the above test, a group of 133 whiplash patients were divided into one high in neuroticism and one low. The groups so selected were then compared on 16 variables related to severity of pains, number of pains, current status of pains, and attitude to settlement. In almost all cases, the results favoured slightly the group lower in neuroticism (in terms of "healthy" responses). If one were to take the results at face value, the conclusion would be that "neuroticism" is slightly related to the amount of pain suffered, the length of times the pains persisted, and attitudes to settlement. However, the test itself is limited in terms of items and also prejudices the relationship between whiplash injury and "neuroticism". To assume that a positive answer to questions related to trouble sleeping at night, feeling tired when arising, or the need for extra care in looking after one's health, indicate neuroticism, presupposes the symptoms are of emotional origin and not physically generated by tissue damage.

WHIPLASH INJURY — INCIDENCE

Studies dealing with the incidence of neck injuries due to traffic accidents appear to be few. Some data nevertheless does exist. Braunstein and Moore³⁶ (1959) reported on Cornell Automotive Crash Injury Research data. Of 12,764 persons involved in rural highway accidents, 144 (1.1% of all vehicle occupants) suffered whiplash injuries. This figure might be different from similar data gathered for accidents occurring in urban areas because of the different speeds common in the latter. A suggestion has been made that whiplash injuries are most common in the latter.

deGravelles and Kelly obtained interviews with 208 occupants of 156 cars involved in rear-end accidents. About 45% of these reported some injury as a result of the accident; 42.8% reported injuries to the back or neck; that is, 89 people reported such injuries. Of these 89 people, only

35 No 28

36 No 7

5 said that they did not consider their injury a "whiplash" injury. Thirty people said they did not know; the others (almost two-thirds) considered that "whiplash" injury did aptly describe their injuries. In other words, of the total number interviewed, slightly over 25 percent believed they had suffered a whiplash injury. Since the authors selected only 15 percent of the total number of accidents (only "pure" rear-end collisions), the percentage of all accident victims suffering from a whiplash injury would be almost 4 percent.

In Manitoba, in 1969, the number of car accident injuries was 9,470*. Using the 4% figures from above, it could be estimated that the number of people suffering from a whiplash injury would be 380. Unfortunately no Manitoba figures are available, however the figure may be considerably greater.

SUMMARY

1. The very term "whiplash" is in dispute with some experts believing it to be fallacious and injurious, in that the fears associated with it may serve to produce and prolong emotionally-based symptoms.
2. The physical injury associated with rear-end auto accidents is associated with the stretching of neck muscles, first backward and then forward. The injury is related to the rate of acceleration when struck, which may bear little relationship to the damage sustained. People facing the rear of the car or hit from the side are less affected than when facing forward.
3. Symptoms are frequently minimal at first, becoming more severe after 24 hours. Prominent symptoms include neck pain and stiffness, back pain and headaches. Less frequent symptoms are numbness of extremities, difficulty in swallowing, and blurring of vision.
4. There is considerable divergence of opinion with respect to the part that emotional factors play in the victim's response to his injuries. Factors mentioned as contributing to the development of a "litigation neurosis" are pre-accident personality, secondary gain factors associated with obtaining attention or avoiding unpleasant responsibilities, fears associated with the future, anxieties related to the litigation, desire for financial compensation, etc.
5. Whatever the reason, it seems to be generally held that the symptoms decrease after legal settlement.
6. At least one investigator believes that there are special psychological factors associated with the experience of a whiplash injury related to its unexpectedness which produces a strong persistent anxiety reaction.
7. Not all people involved in rear-end collisions experience a whiplash injury, and undoubtedly only a portion of the injured institute legal action. This suggests that the whiplash subjects may be a special group, but does not make clear in what way — ie: whether the critical factors relate to the accident, the personality make-up of the victim, or special economic factors, etc.

II METHODOLOGY

The primary concern of this investigation was to explore the relationship between whiplash injuries and psychological symptoms. It is evident, from

* Figure obtained from Manitoba Bureau of Statistics.

the literature, that many whiplash victims do suffer from emotional complaints long after the accident and even after the litigation. Such symptoms are variously attributed to the peculiar nature of the accident itself, the public's abnormal fear associated with the term, pre-morbid personality factors leading to secondary gains, and the monetary compensation involved. The plan was to test and interview a representative sample of whiplash subjects before and after litigation, with a follow-up of a selected group who experienced the greatest disability associated with the accident. This latter group was interviewed, on the average, six years after the accident.

Subjects:

The subjects of this study were selected by law students from court records. Each subject was selected if he or she appeared as a litigant with respect to a whiplash injury during a three year period. Initially only subjects were selected whose claims had been settled (N - 97), and then a further smaller group of litigants were selected whose claims were pending (N - 23). Each subject so selected was sent a letter* asking them to participate in a research study which had the approval of his lawyer (previously secured). It was pointed out that the results would be confidential and would have no bearing whatsoever on the settlement itself, (approximately 80% had received before the letter was sent).

Approximately one half of these contacted by phone following the letter were subsequently interviewed in their home by a law student, who also administered the psychological tests. The reasons for not volunteering included: preferred not (20% of non volunteers); postponed and then couldn't be reached (40%), could not arrange appointments (40%). The interviews were conducted during the summers of 1969, 70, and 71 — with 120 subjects taking part.

To what extent the above sample is truly representative of the total group of whiplash litigants is impossible to determine. Those who were reluctant gave many reasons including their doctor's or lawyer's advice, general disinterest, time pressures, etc. Another group expressed willingness but the necessary arrangements for interviews and testing could not be satisfactorily arranged. It is reasonable to suppose that some of them also were hesitant to become involved for other reasons.

As previously mentioned, the whiplash litigant group as a whole may be self-selected. Again, there is no way to prove this, apart from noting that the incidence of rear-end car accidents is greater than the number of people seeking legal redress through the courts. Most of the subjects in this study indicated that it was their doctor who advised them to see a lawyer, so that many factors could come into play, such as who their doctor was, the severity of the injury, personality characteristics, etc. Such factors may be instrumental in one person's becoming involved in litigation and another one not seeking legal aid.

The number of lawsuits selected for possible study by the authors involving whiplash injuries in Winnipeg was 284 the year 1969. An analysis of the court records indicates that one half resided in Winnipeg, 27 percent from its suburbs and 23 percent outside the area of metropolitan Winnipeg. Only 37 percent were female, which differed from the sample investigated in this study, which is approximately 50 percent female. By occupation, 45

* See Appendix A for copy of letter

percent were classified as "blue collar", 15 percent "professional", and 28 percent "business". Occupational categorization was somewhat arbitrary, but coincided basically with standard sociological classifications of occupational livelihood. For reasons of practicality, only subjects* living in metropolitan Winnipeg were used — thus not including the proportion injured in the province (estimated at 23 percent in 1969) The subjects used in the study are roughly representative of the general urban population in terms of occupation.

Method:

The method of evaluation was a semi-structured interview in which each subject was asked to describe the circumstances of the accident, consequent injuries, and how he came to seek legal compensation. He was then asked to answer a 60 item test, indicating how he felt just prior to settlement. Following this the interviewer enquired into his subsequent adjustment, including his views with respect to both legal and medical treatment. Finally, each subject was asked to fill in another comparable 60 item psychological test detailing his present psychological state. This procedure was adhered to for the first 97 subjects.

The second group of 23 was interviewed and tested prior to legal settlement and then again following settlement. The general characteristics of this group can be seen in Table I, as well as those of these other control group who were used for comparison purposes.

Psychological Test:

A test was devised by selecting items from two well established psychiatrically oriented test, the MMPI and the Cornell Medical Index** . Two forms were devised, one in which the items were phrased in the past tense (in which the subject responded to when describing how he felt prior to settlement), and one in the present tense, describing his present emotional state. Apart from time orientation, the two tests were identical, although the items were ordered differently to provide some illusion of dissimilarity.

Each test*** contained seven questions which related to anxiety symptoms, five to depressed feelings, sixteen to somatic symptoms, fourteen to neuromuscular complaints, fourteen to neurotic reactions, and four were labelled as miscellaneous as no agreement could be reached by the investigators as to what specific symptom area they encompassed. A total score was calculated by adding up the total number of items answered in a positive (ie., presence of symptom) fashion — thus yielding a possible total score of 60, plus a separate score for each of the sub-categories of anxiety, depression, somatic, neuromuscular, neurotic, and miscellaneous.

Test Procedure:

It was decided to test the majority of the subjects following settlement as it was thought that testing prior to settlement might bias the data, if, in fact, a compensation factor was important, i.e., subjects exaggerating their

* A group of 10 subjects were located in Nova Scotia and were referred to one of the authors (Mr. Bass) as being of particular interest. Since neither the test nor biographical findings distinguished them from the larger group, they were incorporated with the total group.

** The MMPI (Minnesota Multiphasic Personality Inventory) and the Cornell Medical Index are two objective type personality tests used widely for diagnostic purposes. The authors selected items from these two tests in making up their "whiplash" inventory. In so doing they were able to devise a shorter test than either of the above tests and include a larger proportion of specific items dealing with neuro muscular complaints. The advantage of borrowing items from established tests have been carefully selected and tested for clarity, plus having demonstrable utility in differentiating normal and psychiatric population validly.

*** see Appendix B.

symptoms, either consciously or unconsciously motivated by a desire to increase the compensation. On the other hand, it was recognized that asking an individual to indicate how he felt a year or more in the past might be subject to error as well. To assess this factor, a group was tested prior to litigation and then following so that a comparison of the methods could be made.

On the average, the time lapse between the accident and settlement was 19.5 months and between settlement and the second testing was 13.2 months. The average time between the accident and the second testing was 32.7 months.

Since the test was designed for this study, it was impossible to make direct comparisons with established norms (although some extrapolations could be made). For this reason, it was decided to use three other groups for comparison purposes. A normal group was made up of a class of summer school university students. As can be seen from Table I, they were both younger and better educated than the whiplash group with a higher proportion of male subjects. Each student was asked to answer the tests in terms of (a) how they believed they felt one year ago, (b) how they felt at the time of testing. A second group of 20 orthopedic patients was tested as it was thought they had at least a physical injury in common with the whiplash group — all of the orthopedic patients were being treated for broken, fractured, or separated bones at the time of testing. As a group, they are approximately similar in terms of age and education to the whiplash group — though again the male-female ratio is more heavily weighted with males. The final group of 22 subjects was obtained from the psychiatric ward of a large general hospital. Such a group might be expected to obtain a high score on a test of psychiatric symptomatology due to the problems that brought them to hospital plus being in a setting which would encourage the frank acknowledgement of negative emotional feelings. As a group, the psychiatric patients were similar to whiplash subjects in terms of age and education, with a higher proportion of females.

TABLE I
COMPARISON OF GROUPS USED IN WHIPLASH STUDY

	Age	Education	Sex Distribution (Male - Female)
Whiplash Group N=120	43.2 10	10.5 3.2	53 - 49
Normal Group N=48	26.5 13	14.2 2.6	34 - 14
Orthopedic Group N=22	39.9 11.2	11.2 3.6	13 - 9
Psychiatric Group N=20	39.6 13.4	9.4 2.8	9 - 10

III. RESULTS

I. WHIPLASH GROUP: BEFORE AND AFTER SETTLEMENT

Each subject's test protocol, before and after litigation, was scored according to whether his answer reflected emotional or physical disturbance. A score of sixty, for instance, would mean that every item had been answered in a way indicating emotional disturbance, while a score of zero would indicate a total lack of emotional or physical upset.

The average score of the whiplash group prior to settlement was 24.3, and following was 19.0 (see Table 2). This is a statistically significant difference and indicates that the whiplash group 13.2 months after settlement had significantly fewer physical and emotional complaints. Each of the sub-categories were also significantly reduced — anxiety, depression, somatic, neuromuscular, and miscellaneous symptoms. However, it should be noted that both scores are high prior to and following litigation. For instance, one half of the questions were taken from the Cornell Medical Index, which numbers 100 items. The psychiatric cutoff score which presumably screens out the non-psychiatric groups for this test is 23 items. In other words if a subject endorsed approximately $\frac{1}{4}$ of the items in a direction indicating emotional and physical disturbance on the Cornell Medical Index then he would be judged as likely to have a psychiatric problem. The whiplash subjects endorsed a higher proportion of items in a psychiatric direction both before and after litigation on the test employed in this study. Assuming the basic character of the devised whiplash test is similar to the Cornell Medical Index, then a cutoff score of 14 would place a subject in the psychiatric range whereas the actual scores — pre and post-litigation were 24.3 and 19.0 respectively.

TABLE 2

MEAN SCORES ON WHIPLASH TEST ACCORDING TO
DIAGNOSTIC GROUP AND PSYCHIATRIC SUB CATEGORY

	Anxiety	Depression	Somatic	Neuro- Muscular	Neurotic	Misc.	Total Score
Whiplash Subjects Prior to Settlement N= 120	3.1	2.8	4.9	7.0	4.4	1.7	24.3
Whiplash Subjects Following Settlement	2.4	2.0	4.1	5.1	3.6	1.2	19.0
Normals - as they felt one year ago N= 46	1.8 ₊ *	1.2 ₊ *	2.6 ₊ *	2.0 ₊ *	3.0 ₊ *	.6 ₊ *	11.2 ₊ *
Normals - as they feel now	1.7 ₊ *	1.1 ₊ *	2.6 ₊ *	1.9 ₊ *	2.9 ₊ *	.6 ₊ *	10.9 ₊ *
Psychiatric Patients N= 22	3.6	3.0	5.9	5.2	6.5*	1.4	25.4
Orthopedic Group N= 24	1.8*	1.1*	2.5 ₊ *	2.4 ₊ *	2.4 ₊ *	.4*	11.2 ₊ *

* Scores significantly lower than whiplash subjects prior to litigation

+ Scores significantly lower than whiplash subjects following litigation

Comparing the sub tests in terms of individual item frequency of response, the most responded to items were depression (.56); i.e., more than one half of items dealing with depression were responded to positively, followed by neuro-muscular (.50), anxiety (.44), miscellaneous (.42), somatic (.31), and neurotic (.31). From this it can be seen that whiplash patients do not suffer exclusively, or even primarily, from complaints related to their neuromusculature. Rather they experience a broad band of symptoms, the majority bearing no direct relationship to the presumed site of injury. Interestingly enough, although there is a decided reduction in the magnitude of the symptom picture following settlement, the order of magnitude remains the same. In other words, recovery is not related to the injury itself, in terms of presumed tissue damage, but rather to a generalized reduction of symptoms related to emotional rather than physical health.

It will be recalled that 20 percent of the patients were tested prior to settlement. The mean score for this group before litigation was 25.3 and following, 18.5. These scores are less than one point different from the scores obtained when asking people to respond to their pre-settlement adjustment from memory. This lack of difference would encourage the belief that the scores derived from memory were not grossly inaccurate.

II. COMPARISON OF WHIPLASH GROUPS WITH OTHER GROUPS

Table 2, shows how the four groups compare with one another on the whiplash psychological test. In terms of total score, the highest score is obtained by the psychiatric group (25.4), followed by the whiplash group prior to settlement (24.3), then the whiplash group following settlement (18.0, orthopedic group (11.2), normal group (11.2) and (10.9).

WHIPLASH GROUP AND PSYCHIATRIC GROUP

Comparing the whiplash group prior to settlement with the psychiatric group, there are only two score differences which proved to be significant using a Chi square test. Psychiatric patients proved to have more neurotic symptoms and fewer neuro-muscular complaints.

Thirteen months after settlement, the total score decreased by 5.3 points for the whiplash group (significant at .001). The only area in which psychiatric patients had more symptoms than post settlement whiplash at a significant level was neuroticism (significant at .005 level).

Compared to the orthopedic group, the whiplash group prior to settlement has more symptoms in all categories: anxiety, depression, somatic, neurotic, neuro-muscular, and miscellaneous. Following the settlement, they remain significantly higher in terms of somatic symptoms, neuro-muscular, neurotic, and total score.

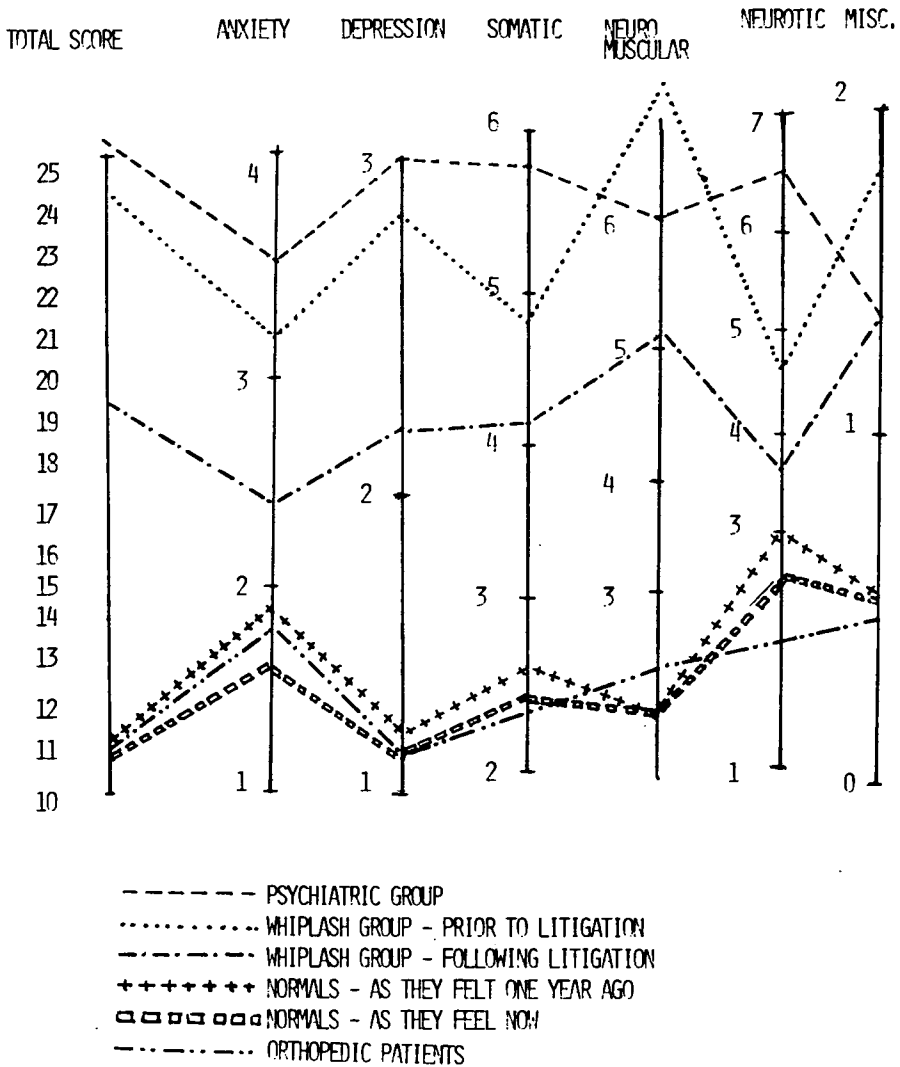
All scores before and after settlement were higher for whiplash subjects than for the normal controls.

In terms of scores, the psychiatric and the whiplash group have the most in common, while the orthopedic group and the normal group were very similar (See Graph 1).

III. COMPENSATION SYNDROME

A hypothetical "compensation syndrome" group was selected on the basis of test scores. The criterion used was an improvement of at least 12 points from pre- to post-litigation testing. In other words, each subject

GRAPH 1
 COMPARISON OF WHIPLASH SCORES PRIOR TO AND
 FOLLOWING LITIGATION WITH NORMAL ORTHOPEDIC
 AND PSYCHIATRIC GROUPS



selected had shown marked improvement in his physical and emotional state following the legal settlement of his claim. Exactly one quarter of the total group (N - 30) qualified with a mean score prior to litigation of 29.0 and following of 12.7 — ie., an average improvement of 16.3 points whereas the total group minus the above, have an average of 1.6 points.

The "compensation group" was then compared to the "no change" group with respect to the time interval between the accident and the settlement, the time of settlement and time of interview, the amount of

compensation, education, age, sex distribution, and satisfaction with settlement. From Table 3, it can be seen that the only statistically significant variables were age and education, the "compensation group" being younger and better educated. Thus, it would appear that marked improvement in symptoms is relatively unrelated to such factors as the satisfaction with the settlement or the time intervals involved between the accident and the settlement, although the "high change" group did receive its settlement four months sooner, on the average, than the "no change" group.

The labelling of the "high change" group as being a "compensation group" is perhaps unwarranted. The improvement, though marked, took place over a year's time and so could be due to many other factors. All that can be said is that if economic compensation were a significant factor in recovery, then this is the only group to which it would seemingly apply — one quarter of the total number.

TABLE 3

COMPARISON OF SUBJECTS WITH GREAT
IMPROVEMENT IN SYMPTOMATOLOGY FOLLOWING SETTLEMENT
VS. THOSE WITH NO IMPROVEMENT

	Great Improvement	No Improvement	"t"	
Time Between Accident and Settlement	MONTHS 18.3 X 8.7	22.7 X 10.4	1.345	N. S.
Time Between Settlement and Testing	MONTHS 13.4 X 8.7	12.0 X 12.4	.306	N. S.
Amount of Compensation	\$ 2194 X 1321	\$ 2533 X 2096	.451	N. S.
Education	12.1	10.4	2.304	< .05
Age	37.0	41.0	2.80	< .01

Sex Distribution

	Male	Female	
Great Improvement	16	14	Chi Square = N. S.
No Improvement	18	11	

Satisfaction with Settlement

	No	Uncertain	Yes
Great Improvement	14	3	5
No Improvement	11	5	1

Chi Square = N. S.

IV. COMPARISON OF WHIPLASH SUBJECTS WITH HIGH AND LOW TEST SCORER

The total whiplash group was divided into four groups on the basis of their initial test scores. The groups were as follows:

Group	Score Range	Number
Very high	over 35	18
High	25-34	40
Medium	11-24	45
Low	less than 11	17

The four groups were then compared with respect to several variables related to their whiplash accident and subsequent settlement. On some occasions all four groups were used, on others, depending on the number, the two top and two bottom groups were combined.

Age, Education and Sex — Comparing the four groups with respect to the above variables the following results were obtained:

Group	Mean Age	Mean Grade	Sex Distribution (Male-Female)
V-H	45.5 12.2	11.2	5 - 13
H	42.0 12.6	11.0	19 - 21
M	43.3 12.7	10.1	25 - 20
L	44.0 10.7	10.5	10 - 7

None of the above results approach significance statistically, except the sex distribution, where there is a tendency for women to score higher than men.

TIME INTERVAL BETWEEN ACCIDENT, SETTLEMENT AND TESTING

An inspection of Table 4 indicates little if any relationship between the severity of the symptoms prior to litigation and the time interval between the accident and the settlement or between the settlement and the time of testing. Such a finding would tend to dispute a commonly held assumption that the best "cure" for a whiplash injury is a quick financial settlement.

TABLE 4

A. COMPARISON OF TIME INTERVAL BETWEEN ACCIDENT, LITIGATION AND TIME OF TESTING FOR WHIPLASH SUBJECTS GROUPED BY TEST SCORE

		Very Low Group	Medium Group	High Group	Very High Group
Time in Months Between Accident and Settlement	Mean	18.5	18.1	19.9	22.0
	\bar{y}	4.6	6.8	8.1	11.4
	N	6.	36	28.	6.
Time in Months Between Settlement and Testing	M	13.6	13.9	13.1	12.0
	\bar{y}	8.2	7.4	8.2	9.1
	N	6.	35.	28	6.
Total Time Between Accident and Testing	M	32.1	32.0	33.0	34.0
	\bar{y}	7.6	6.9	7.7	8.2
	N	6.	35.	28	6.

B. COMPENSATION RECEIVED

		Low Group (Very Low & Medium)		High Group (High & Very High)
Amount of Compensation	MEAN	\$2,104	MEAN	\$2,541
	S.D.	\$2,017	S.D.	\$1,854
$t = N.S.$				

C. SATISFACTION WITH PHYSICIAN AND LAWYER VS. TEST SCORE

	Lawyer			Physician	
	Satisfied	Dissatisfied		Satisfied	Dissatisfied
High Scores	32	18	High Scores	41	12
Low Scores	36	11	Low Scores	44	14
$\text{Chi Square} = N.S.$			$\text{Chi Square} > N.S.$		

SATISFACTION WITH LAWYER, PHYSICIAN AND COMPENSATION

No differences could be found with respect to the above variables. This is a rather surprising finding if one were to assume that the prolongation of symptoms was psychological in origin. In other words those patients who were still suffering long after the settlement might be expected to be somewhat more bitter with respect to their legal and medical treatment, however, such seemingly was not the case.

PREVIOUS ACCIDENTS, HOSPITALIZATION, LAWSUITS, AND OPERATIONS (SEE TABLE 5).

Again the results were negative in terms of differences between subjects with few remaining symptoms and those with many, at least in terms of statistically significant differences. Such a finding casts doubt on the possibility that the high symptoms group is a special group in terms of the above variables.

TABLE 5

RELATIONSHIP BETWEEN WHIPLASH TEST SCORES AND PREVIOUS ACCIDENTS, HOSPITALIZATIONS, LAWSUITS, OPERATIONS AND ETHNIC BACKGROUND

	A			B	
	Previous Accidents			Previous Hospitalization	
	Yes	No		Yes	No
High Score	10	22	High Score	13	12
Low Score	7	34	Low Score	17	20
$\text{Chi Square} = N.S.$			$\text{Chi Square} = N.S.$		
	C			D	
	Previous Lawsuits			Previous Operations	
	Yes	No		Yes	No
High Score	5	16	High Score	10	15
Low Score	2	23	Low Score	14	24
$\text{Chi Square} = N.S.$			$\text{Chi Square} = N.S.$		

	E				
	Ethnic Groups				
	1	2	3	4	
Very High	1	3	3	3	Grp. 1 = Anglo Saxon
High	3	5	7	3	Grp. 2 = Western European
Low	2	4	6	4	Grp. 3 = Eastern European
Very Low	1	0	2	1	Grp. 4 = Other
Total	7	12	18	11	

Chi Square = N.S.

V. ITEM ANALYSIS OF WHIPLASH TEST RESULTS.

An attempt was made to derive an objective picture of the whiplash experience by selecting those items from the whiplash test that: (a) were most endorsed as characterizing the pre-settlement adjustment; (b) changed to the greatest extent pre and post settlement, and (c) changed the least. (See Table 6).

Test Results Prior To Settlement

Test items were selected that were endorsed by at least 60% of the whiplash group. The items can be seen in Table VI with their proportional endorsement. Summarizing the picture that emerges, whiplash subjects prior to litigation complain that they are having difficulty working, are frequently tired and exhausted, feel pains in their neck, experience headaches, worry about their health, have dizzy spells, pains in the back, sleep fitfully, and have trouble with their eyesight.

Improvement One Year After Litigation

Items were selected that showed an improvement of at least 20% between testings. The range was from 36 to 21 with a mean of 24.3. The changes most evident are feeling less weak, having fewer dizzy spells, having fewer pains in the back, being less irritable, having fewer areas of numbness in the body, less problem with pain and pressure relative to work, less worry about health, better sleep, and improved eyesight.

No Improvement One Year After Litigation

Test items were selected that showed little or no change between testing prior to and following litigation. The range was from +14 to -4 with an average of +4.5; ie, there were more endorsements of the given item following litigation than before. Approximately one year after settlement the total whiplash group found no improvement with respect to their general physical health relative to their friends, were as troubled by constipation, reported as many pains in the chest and heart, were as frightened by sudden movements and noises at night, had as much trouble with balance and ringing in their ears and still experienced some headaches.

TABLE VI

**A. QUESTIONS ANSWERED POSITIVELY BY AT LEAST 60 PERCENT
OF W-L GROUP PRIOR TO LITIGATION**

PERCENTAGE	ITEM
83%	Were you as able to work as you ever were? (No)
73%	Did you wake up fresh and rested most mornings? (No)
73%	Did you get spells of exhaustion and fatigue? (Yes)
73%	Did you ever feel pain in the back of your neck? (Yes)
69%	Did you worry about your health? (Yes)
69%	Did pains in your back make it hard for you to keep up with your work? (Yes)
66%	Did you have very few headaches? (No)
63%	Was your sleep fitful or disturbed? (Yes)
62%	Was your eyesight as good as it had been for years? (No)
61%	Did you have difficulty falling asleep? (Yes)

**B. ITEMS THAT HAD THE GREATEST CHANGE FROM PRE TO POST
SETTLEMENT TESTING**

PERCENTAGE PRE - POST	ITEM
83% - 47%	Were you as able to work as you ever were? (No)
50% - 25%	Did you feel weak most of the time? (Yes)
52% - 27%	Did you have dizzy spells? (Yes)
69% - 45%	Did you feel pain in the back of your neck? (Yes)
61% - 38%	Were you easily upset or irritable? (Yes)
45% - 23%	Did you have numbness in one or more parts of your body? (Yes)
53% - 21%	Did pressure or pain make it hard for your to do your job? (Yes)
82% - 61%	Did you wake up fresh and rested most mornings? (Yes)
62% - 41%	Was your eyesight as good as it has been for years? (Yes)

**C. TEST ITEMS THAT CHANGED LITTLE BETWEEN PRE AND POST
SETTLEMENT TESTING**

PRE - POST	ITEM
20% - 33%	Have you fainted more than twice in your life? (Yes)
41% - 53%	Were you troubled with constipation? (Yes)
29% - 36%	Did you tremble or feel weak if someone shouted at you? (Yes)
26% - 32%	Did you have pains in your chest or heart? (Yes)
22% - 28%	Did you become scared at sudden movement or noises at night? (Yes)
27% - 28%	Were you considered a nervous person? (Yes)
39% - 40%	Did you ever notice a ringing and buzzing in your ear? (Yes)
38% - 37%	Were you bothered by pains in your chest? (Yes)
66% - 65%	Did you have few headaches (No)
51% - 48%	Did you have trouble in keeping your balance? (Yes)

IMPLICATIONS

Although in a previous section it was noted that improvement post and pre settlement seemed to be general rather than specific to the injury, an items analysis challenges to some extent this generalization. One has the impression that the most frequently experienced symptoms before settlement involve generalized exhaustion and malaise with some focus in the musculature in the neck, back and head. Following litigation, the report is that there is less weakness, improved work performance, and less worry about health. Specifically, pressure, pain and numbness in parts of the body are reduced with improved sleep. However, a year after settlement, there remains a substantial residue of symptoms which appear to reflect a degree of apprehensiveness about the future plus rather generalized aches and pains. Thus they are frightened by sudden movements, are uncertain of their balance, still hear ringing in their ears, and do not believe their physical health is as good as that of their friends.

VI. SYMPTOMS RELATED TO WHIPLASH INJURY

Each subject was asked to fill in a questionnaire indicating 1) the most disabling physical symptom; 2) the physical symptom remaining the longest; 3) the most unpleasant physical after-effects of the injury; 4) the most unpleasant feature of the experience; and 5) special fears associated with whiplash accidents. Table 7 provides an overview of the results.

It can be seen that neck symptoms are reported as most disabling, longest remaining and having the most unpleasant physical after-effects. Back pain follows in terms of being disabling while headaches are viewed as remaining the longest and being most unpleasant (apart from neck pains). Generally pain and/or numbness of arm and shoulder follow neck pain, back pain and headaches, while dizziness and sensory or motor symptoms come next. Many other specific physical symptoms such as impotence, blurred eyesight, loss of memory and general fatigue were listed under "other" as they were not responded to by more than three subjects. These findings are consist with other research findings and suggest the group under investigation is typical, at least, in terms of symptoms.

TABLE VII

1

PHYSICAL SYMPTOMS MOST DISABLING FOLLOWING W-L

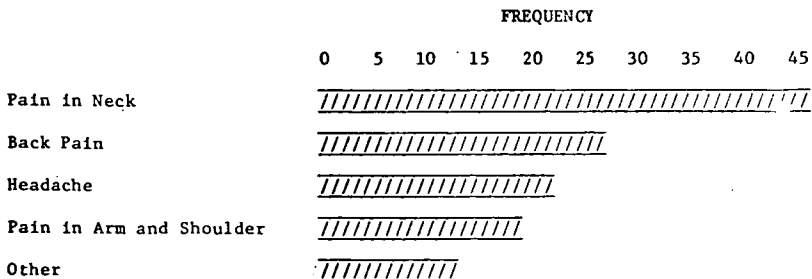


TABLE VII (CONT.)

2

PHYSICAL SYMPTOMS REMAINING LONGEST AFTER W-L

	FREQUENCY									
	0	5	10	15	20	25	30	35	40	45
Neck Pain										
Headache										
Back Pain										
General Soreness										
Pain or Numbness of Arm										
Dizzy Spells										
Sensory or Motor Loss										
Other										

3

MOST UNPLEASANT PHYSICAL AFTER EFFECTS ASSOCIATED WITH W-L

	FREQUENCY									
	0	5	10	15	20	25	30	35	40	45
Neck Pain										
Headache										
Back Pain										
Generalized Soreness										
Pain or Numbness of Arm										
Dizziness										
Sensory or Memory Loss										
Other										

4

MOST UNPLEASANT FEATURE OF EXPERIENCE ASSOCIATED WITH W-L

	FREQUENCY			
	0	5	10	15
Pain				
Worries Re Health and Future				
Length of Time of Settlement				
Attitude of Insurance Ad-justors				
Financial Settlement				
Going to Court				
Physiotherapy				
Other				

TABLE VII (CONT.)

5

SPECIAL FEARS ASSOCIATED WITH WHIPLASH INJURY

	FREQUENCY									
	0	5	10	15	20	25	30	35	40	
No Special Fears	////////////////////									
Future Health and Earning	////////////////////									
Back Pain	//////////									
Yes - Unspecified	//////////									
Permanent Pain	//////									
Neck Pain	//////									
Other	//////////									

The two remaining categories of the most unpleasant feature of the experience and special fears, tap a wider range of symptoms than purely physical. In Table VII-4, the ordering of unpleasantness in term of frequency is: pain, worries about future (usually in terms of job adequacy), the length of time taken to reach a settlement, the attitude of the insurance adjusters (not sympathetic), the financial settlement itself (will it cover costs and loss of earning time?), the anxiety of going to court and finally the bother of going for physiotherapy treatments. Many subjects did not answer this item. The last question had to do with special fears. Those listed include: future health and earning capacity, back pain (its continuance), the admission that they had special fears (a "yes" response) with no further elaboration, concern about permanent pain and neck pain continuance.

A comparison was made of those who said they had no fears as compared to those who admitted to at least one fear with respect to their total test score. It was thought possible that fears associated with the outcome of a whiplash injury might be related to a number of symptoms experienced. The method used was to compare the number of no fear subjects whose score fell below and above the mean score for the total group on the whiplash test, with those who expressed associated fears.

Test Scores Prior to Litigation

Whiplash Subjects	0-24	25-61
No Fears	29	13
Fears	36	35

Test Scores Following Litigation

Whiplash Subjects	0-17	18-16
No Fears	27	15
Fears	37	35

From the above it can be seen that there is some relationship between special fears and the number of symptoms reported on the whiplash test. However statistical significance was not achieved.

A similar comparison was made of female and male subjects, to find out whether expressing "no special fears" on the questionnaire was more typically a male response (perhaps because men are more reluctant to admit fear) or female (men being more concerned about earning a living). No such difference could be demonstrated.

Test Score Prior to Litigation

		0 - 24	
		M	F
No Fears		22	16
Fears		38	37

RESUME OF OBJECTIVE TEST AND QUESTIONNAIRE FINDINGS TOTAL GROUP OF WHIPLASH SUBJECTS ON WHIPLASH TEST

The whiplash group had a high score on the Whiplash test, being much more comparable to a psychiatric group than to an orthopedic or normal group. Using a cut off score of 14, arrived at by extrapolation, 83.5 percent of the whiplash group would score above this figure — indicating 15 or more symptoms prior to litigation, and 66.3 percent after litigation. Only 17.4 percent and 19.4 percent of the normal population scored above 14 points while 29.2 percent of the orthopedic group were above this figure. In other words, the whiplash group is clearly more emotionally disturbed than these two groups. The psychiatric group had 86.3 percent above a score of 14, very similar to the whiplash group prior to litigation. There is a significant drop in score following litigation for the whiplash group, however, they still have many emotionally related complaints some 2½ years after the accident.

As significant is the fact that these symptoms are distributed over a broad spectrum of ailments, including depression, anxiety, neuro-muscular symptoms, somatic symptoms and neurotic symptoms. Such a finding is consistent with the description of the traumatic or accidental neurosis which is characterized as involving anxiety, depression, headaches, postural dizziness, irritability, restlessness and sleeplessness, plus general somatic symptoms.

Within the whiplash group two comparisons were made:

- a) those scoring high with those scoring low on the whiplash test and;
- b) those showing little change in score prior to and following litigation with those having a considerable drop in score.

High Scorers on Whiplash Test vs. Low Scorers

A number of comparisons were made here between those scoring high and low, including age, sex, education, interval between the accident and the settlement, time between the litigation and testing, the amount of compensation received; the satisfaction felt from their doctor, lawyer, and amount of compensation; number of previous accidents, previous hospitalizations, lawsuits and operations; and ethnic origin. Although there was a tendency for the high scoring group to fall in an predicted direction, ie. more previous lawsuits, less satisfied with compensation, etc., no single difference proved statistically different. The closest to significance was the sex factor, with women tending to have higher scores than men.

Subjects with Little Change in Whiplash Test Score vs. Those with Considerable Change

Approximately 25 percent (N - 30) had a change of at least 12 points between pre and post litigation testing — thus qualifying for a "compensation" group on the basis of their improvement following the litigation. Comparing them with a "no change" group, there was no significant difference between the sexes; the various time intervals related to the accident, the settlement and the testing; the amount of the compensation received or the satisfaction expressed it. Those who improved markedly were, however, younger and better educated, than those who did not.

Other Findings

Although it could not be demonstrated that cultural background was related to the severity of symptoms associated with a whiplash injury, there is evidence that certain cultural groups are over-represented. Thus in Table IV those with Anglo Saxon background number 7 (16%), those of Eastern European number 18(37%) although in the province of Manitoba the percentage ratio is (Manitoba, Canada, 1973) 42.9 percent to 17.1 percent.* The symptom picture, as presented in the questionnaire lists the symptoms in order of importance to the subject, neck complaints followed by headaches and backpains. Such findings are congruent with other studies.

An important finding was that physical and emotional symptoms were still reported by the majority of the subjects over a year following the settlement and nearly three years after the accident. This result is consistent with a study reported by Macnab in which 45 percent of 145 patients reported symptoms two years following settlements.

* Manitoba Canada 1973.

IV DISCUSSION

The task the investigators set themselves in this study was to learn more about why people who experience neck and back strain or injury associated with a rear end collision should develop such multitude of symptoms, subsumed under the diagnostic term "whiplash injury". Possibilities include: (a) the injury itself, which may be more debilitating physically than generally appreciated, (b) the presence of a strong compensation factor — whiplash being linked in the public's mind with court action, (Such a response could be conscious or unconscious, the critical factor being its relationship to economic gain,) (c) an iatrogenic * factor associated with its medical treatment and (d) a traumatic neurosis, precipitated by a sudden shock on an unsuspecting and psychologically vulnerable organism. Each of these alternatives will be considered in the light of the present evidence.

Traumatic Injury:

One of the difficulties in assessing the extent of the physical damage associated with a whiplash injury is the lack of objective medical findings coupled with strong but conflicting medical opinion. This difficulty possibly accounts for the lack of relationship between the extent of persisting debilitating symptoms and the compensation received - as presumably the judge would be influenced by positive medical evidence of damage. Thus one is left with two possibilities, (a) there is little or no relationship between tissue and muscle damage and emotional symptoms, or (b) the physical damage cannot be properly adduced by present diagnostic methods, therefore the lack of relationship is due to not being able to demonstrate what is really there.

Compensation Factor:

The evidence would not support the hypothesis that a desire for compensation plays a significant role in the symptomology of whiplash victims — apart from the group of 30 patients (approximately 25%) who showed a dramatic reduction of symptoms following litigation. This group was somewhat younger and better educated than the others, containing 3 lawyers, one of whom frankly admitted he was out for what he could get. However, the majority showed no remarkable recovery one year after litigation. In fact, if one subtracts the group of 30 from the total, the average drop in score between pre and post settlement is only 1.6 points. Again, the fact that symptoms were much improved after a year, does not necessarily mean a "compensation factor". It simply means that such a factor might apply to the relatively rapid recovery of this group following the settlement of their claim.

Iatrogenic Factor:

Certainly anxieties and fears flourish in situations where physical symptoms are not well understood. Many patients remarked on the widely differing responses from both physicians and the general public — from frank incredulity to a concern giving rise to dire predictions. Litigation undoubtedly accentuates this, as most of the patients would be seen by physicians representing different biases and vested interests. However, against this is the finding that the patients' emotional response was not

* a disease induced by the physician

directly related to (a) the interval he had to wait before settlement, (b) the amount of compensation received, (c) his expressed satisfaction with the settlement, and (d) with his lawyer. In other words, one would anticipate some positive findings here — if the symptoms were to be attributed to situation factors. A somewhat different point is made by Macnab, (29) when he writes: "When a patient breaks his neck even though the injury may involve litigation, a functional overlay is not common. Similarly, when patients break their wrists or sprain their ankles, even if this lesion is associated with an accelerated extension injury of the neck, normal painless function usually returns to the ankles and wrists in the expected time without a functional overlay. Surely these observations suggest that broken necks are treated adequately, sprained ankles are treated adequately, broken wrists are treated adequately; and surely these findings suggest that by failure to treat the whiplash injury adequately, the physician himself may be responsible for producing some of the so-called litigation neurosis."

Traumatic Neurosis:

The theory here would be that within a certain proportion of the population there lurks a neurosis which can be triggered by a sudden shocking event. For this explanation to hold water, one would have to suggest (a) something specific to the event of whiplash itself to precipitate a neurosis (as suggested by Hodge),³⁷ or (b) that the group is a self-selected one. This latter possibility seems more credible. In other words, people with a latent neurosis waiting to be released may find such an occasion in a whiplash accident. These people then suffer inordinately and therefore are directed by the doctor or neighbour to seek compensation. Such an explanation would fit the high "psychiatric" score on the whiplash test and the fact that the symptoms do not abate with settlement.

In evaluating this hypothesis, certain problems arise. How self-selected is the group? As indicated previously, approximately one half of those contacted agreed to be interviewed. It is assumed that many factors contributed to this attrition and that the group finally seen were not systematically different from the others, though they may have been more open, more co-operative, possibly even hoping for some kind of help. However, the real problem is seen as that of estimating the factors which may bring one person to initiate a court action and another not.

The interviewers (who were mature law students but with no clinical training or experience) were impressed with the sincerity of the people they interviewed; also the history of the litigants gave no clue of a neurotic predisposition in terms of frequency of hospitalization or operations. If one assumes that the explanation is that of the traumatic neurosis for those who did and still continue to suffer from the effects of a whiplash injury, the question arises as to why this particular injury is so traumatizing. The orthopedic group studied included individuals with various fractures and broken bones which must have been traumatizing as well. Once we discount the financial aspect (and money appears to play little part in symptom strength or duration for the majority), one is left with the event itself having a potent traumatizing effect not found with other seemingly equal or worse injuries, which may also involve litigation.

In an effort to learn more about the reactions of whiplash victims, a group of 10 were selected for interviews. The basis of selection was their

score on the whiplash test, those having very high scores before and after litigation, being interviewed. The interviewing was done by a clinically trained and experienced person. A summary of the findings is provided in appendix C. The intent of the summary is to convey something of the character of each subject, as he impressed the interviewer, rather than going into detail with respect to his injury and subsequent medical and legal experience. The impressions will be organized using the previous heading of traumatic injury, compensation factor, iatrogenic factor and traumatic neurosis.

Traumatic Injury:

What immediately impressed the interviewer was the number who had either a previous whiplash injury (subject Nos. 4, 9, 2) or previous back injuries (subjects Nos. 5, 6, 8). Such a finding would support the contention of Frankel who believes that people with a history of trauma or disease of the bony and soft tissue many show evidence of degenerative changes which make them particularly vulnerable to the physical trauma of a whiplash accident. Certainly the chances of a given individual being involved in a whiplash accident for any given year must be no greater than 1 in a 1,000. To be involved in 2 within the 2 or 3 years must be even more remote and yet 3 of the 10 were so involved, which surely can be no coincidence. Three of the remaining 7 had had previous back operations, from which they presumably had recovered completely, however "degenerative changes" may well have been present at the time of the accident. With respect to the remaining 4 who had neither a double whiplash injury or back operation, one had experienced multiple injuries with the whiplash accident (No. 1), another had broken her ribs as a child through a bad fall (No. 3) and so may have suffered, and yet another (No. 7) had had a number of falls from horses in her adolescence as an amateur horse trainer.

Financial Compensation Factor:

This was not believed to be an important factor for the group interviewed. Their symptom picture changed little following litigation and there was no financial gain in the continuance of their symptoms.

Iatrogenic Factor:

Although most had had varying degrees of success with medical treatment including psychiatry, the only help they appeared to expect from their doctor was relief of pain — Nos. 1, 4, 7, and 9. As a group they presented a general picture of resignation to the residual effects of their injury with expressed optimism that slowly things would improve. Although iatrogenic factors, as previously indicated, may well have increased the initial anxiety and depression, there was nothing to suggest that they continued to play a critical part in the continuance of this group of patients symptoms. They felt their doctors had done all they could and whatever bitterness was expressed was directed to the driver who had hit them and the amount of compensation received.

Traumatic Neuroses:

The theory that pre-traumatic personality factors are critical in producing a traumatic neurosis finds support in this data. The symptom picture, as described to the interviewer, fits the classical accident neurosis

pattern: depression, anxiety, irritability, difficulty in sleeping, headaches, dizziness, lack of energy and vague somato sensory muscular complaints. All 10 subjects interviewed would agree readily to the above, adding specific neck and back ailments to the list.

However, not all the data fits the stereotype. The typical sufferer of an accident neurosis has been described³⁸ as a dependent inadequate person who uses his symptoms to avoid responsibility or manipulate people. He is pictured as paranoid about his condition, seeing himself as wronged and rejecting any suggestion of a psychological factor. Once the chance for secondary gain, in terms of money or attention is lost, the symptoms presumably dissipate. Such a description simply does not fit these patients. As a group they impressed the examiner as being more than averagely vigorous. Six of the ten, Nos. 2, 3, 4, 5 and 5 and 10, were judged to be unusually active people prior to their injury and continued to function in almost all areas, if at reduced level.

In 1970, Time published an article by a Scottish psychiatrist, called "How to be Fit but Neurotic". He stated that in those patients whose psychiatric problems were triggered by physical ailments, a large proportion were people over involved with physical fitness and health, and so were particularly vulnerable to a neurosis precipitated by a relatively minor physical ailment, at a time when their strength was being to deteriorate. Such neuroses, he stated, were difficult to cure and might last for years. Somewhat along the same line, Lazarte,⁴⁰ when discussing a whiplash victim, stressed the importance of the pretraumatic personality and post traumatic symptoms. He points out that such personality characteristics as extreme independence, initiative, and industry may well constitute a defence against accepting a desire for dependence and succorance. When the delicate psychic balance is upset by an accident which produces symptoms that force the patient to accept a desired but fought against dependency, the new regressive equilibrium may be hard to give up. Reviewing the patients to whom this might apply, their physical energy level is impressive. Patient No. 2 worked prior to the accident, had three children, was active in sports, still works, part-time and has added another child; patient No. 3: active in sports, still bowls, teaches school, looks after her home and two children; patient No. 4 was described as a man who worked 18 hours a day prior to his accident; patient No. 5 looked after her house, 5 children, worked full-time, kept a garden, active in sports when young; No. 6 landscaped her own lot, has three children, took in foster children (9 at one time), worked in doctor's office; No. 10: a busy, successful sales person, active in community work finds it hard to relax unless doing something. One can at least postulate that for this group there may have been secondary gain factor in the continuance of their symptoms, in the sense that their symptoms provided the justification for reducing the level of their activities. Certainly all had curtailed their activities (two drastically) and seemed to have worked out a new less physically active equilibrium.

Seletz⁴¹ mentions that because of continued complaints many whiplash patients see psychiatrists and skeptically suggests that in this case the psychiatrist couch would be more helpful if it were equipped with a

38 Nos 11, 30, 32

39 No 25

40 No 24

41 No 37

traction apparatus used with gentle massage. Three of those interviewed, Nos. 2, 7 & 9, had seen a psychiatrist. Number 2 saw a psychiatrist when in hospital because she was depressed (she felt it helped), No. 7 was referred to a psychiatrist by an insurance company. He reported that she had many emotional complaints quite unrelated to the accident which may have aggravated her symptoms, and No. 9 had a long association with a psychiatrist who tided him over rough spots. Rather interestingly, No. 10, who impressed as conventionally stable, if a bit overactive, said he wished he had seen a psychiatrist after the accident. He thinks it might have helped him to be more realistic about his reduced work tolerance. As it was he tried to hard to keep up his activities and thus slowed up his recovery, or so he believes. A complicating factor is seeing a psychiatrist is that it may be used against you in court, at least this is the claim of No. 9 who says he was ridiculed by the judge when his psychiatric history was revealed, and awarded only \$300 in damages.

VI. CONCLUDING REMARKS AND SUMMARY OF FINDINGS

Reviewing recent literature on the whiplash injury, one has the impression that the number of articles on the subject is decreasing without there being a corresponding resolution to the problems posed by the injury. As Macnab⁴² writes in 1973; "Wildly divergent views are held on the significance of the symptoms, and these diverging viewpoints, rigidly held and hotly contested are firmly based on impression only". It was this dilemma that prompted the present research. The hope was that by using an objective psychological test, it would be possible to control the subjectivity associated with a clinical study, and thereby provide information that could be used to better understand the phenomenon. This hope is believed to have been at least partly realized.

The investigators were initially impressed by the continuing high "neurotic" scores on the whiplash tests and were therefore inclined to view their findings as being in line with Hodge's⁴³ thesis that the whiplash syndrome must be viewed as a traumatic neurosis precipitated in a predisposed individual by the accident, the symptoms persisting by virtue of their secondary gain factors. However other data did not support this conclusion. Using objective findings, it was not possible to establish the presence of a predisposing neurotic pattern in those patients who persisted in having multiple physical and emotional complaints. Also the proportion of those experiencing significant emotional complaints was so high (over 50 percent) that one would have to postulate a critical selective factor to be operating, i.e. that the subjects of the study represented but a small minority of those experiencing a whiplash injury. Such a group, because they over reacted to the injury would initiate legal action and therefore come to the attention of the investigators.

This is an important consideration, as, in actual fact, there were two selective processes involved. One was related to initiating legal action, and the second one had to do with being willing to act as a subject. With respect to the first, using data provided by two separate authors, plus a record of the number of accident injuries in 1969 in Manitoba, the authors were

42. No. 29.

43. No. 20.

unable to determine either the number of whiplash injuries in Manitoba or the proportion eventually initiating a court action. With respect to the second, those who were contacted but were not seen, the impression was that they were not less "neurotic" than those agreeing to be studied. In fact an argument could be made for predicting the reverse - that they were still to upset and/or angry about their experience to wish to reopen old wounds. This is of course, speculation, buttressed only by the response some subjects gave clearly indicating their desire to keep away from anything associated with their accident, as it was still all too disturbing.

The final interviewing of ten most disturbed subjects was done in an attempt to better evaluate the psychic factors involved - the evidence for a predisposing personality pattern plus the extent to which one could see the operation of secondary gain factors. The interviewer was impressed here by the extent of persisting emotional symptomatology, the extent to which such symptoms still were focal in the lives of the patients, the lack of evidence of the sort of pre-existing personality pattern commonly associated with a compensation neuroses, and the extent to which the subjects still functioned in society, though at a reduced level. In short, if one were to diagnose a traumatic neurosis in terms of ongoing symptomatology, then the ten would clearly possess the necessary credentials. However if one were to use other criteria, such as pre-accident personality and present level of activity, then just as clearly the group, except perhaps for one or two, did not. Small wonder then, that expert opinion is divided on the matter.

Returning to recent publications, Macnab⁴⁴ after years of studying whiplash injuries, concludes that somehow the reason that symptoms persist is that doctors do not treat whiplash injuries properly. How else, he asks, can you explain the fact that other more serious physical injuries, also involving litigation, do not present the same persistent problems? How else can you account for the fact that people hit from the side or facing backward in the car, do not suffer similarly, unless you posit the particular mechanics involved when the head is thrown backward? Hodge⁴⁵, as noted, has an answer. It is his contention that it is the unexpected nature of the experience that demoralizes the psyche to the extent that a neurosis is precipitated in a predisposed person. This is a provocative hypothesis, but not convincing to the present investigators without some correlative evidence to support it. In other words if it is the element of surprise is so critical, then surely it should be possible to demonstrate its potency in terms of symptoms generating and retention in other analogous situations as well.

The research team has made no attempt to evaluate treatment methods involved, as neither its training nor its experience would equip them so to do. Nevertheless, even to the lay person it should be apparent that where opinions regarding cause are so divergent, treatment methods must also vary - some⁴⁶ tending to treat the symptoms rather casually, (suggesting that the patient be allowed to use a therapeutic collar if he feels reassured thereby, but that it really isn't necessary), some seeing it as requiring extended psychotherapy,⁴⁷ and at least one ⁴⁸ frankly admitting

44. No 29

45. No 20

46. No 33

47. No 21.

48. No 29

after many years of experience that he is baffled by the patients' lack of therapeutic response, implying the need for a whole new therapeutic approach.

In this research project the attempt has been to use a design that can be replicated. It would be valuable to accumulate objective findings on whiplash subjects using a common instrument, such as the test employed in this study. It is hoped that perhaps some may wish to do so. Hopefully other investigators can improve on the methodology, particularly with respect to a better specification of the whiplash population in terms of the selection factors operating - ie. just how the group studied differed from the total population of whiplash patients. Also long term studies are needed in which various factors such as age, pre-accident personality estimates, modes of treatment, financial concerns, etc. are carefully correlated with rates of recovery.

SUMMARY OF FINDINGS

The syndrome "whiplash injury" is indeed a complex phenomenon. Although certain personality characteristics may play a part in symptom retention, it is difficult to see them as sufficient to explain the total picture, particularly as the group generally impressed as "normal". Possibly the answer lies in a combination of factors:

- (1) The accident itself is "shocking" and develops symptoms, frequently after the fact, that are painful and debilitating.
- (2) Previous back trauma in terms of injuries, accidents, or operations would seem critical in the prolongation of symptoms; presumably due to more fragile state of the spine at the time of the accident.
- (3) Certain personality characteristics (those associated with physical activity, conscientiousness and ambition), may, from a psychological point of view, contribute to the picture because (a) the greater degree of frustration (and fear) of being relatively immobilized and thus unable to achieve necessary goals and (b) possibly unconscious factors associated with the sanction the symptoms provide for reducing the scale and extent of their activities.
- (4) Cultural factors may contribute somewhat in terms of socio-economic level (blue collar workers being more vulnerable) and possible ethnic factors.
- (5) For a minority, the economic compensation factor may be important, and it likely plays some part in all patients as they are encouraged by the litigation procedure to continually vet their symptoms so as to be adequately compensated for time lost at work, possible future limitations, etc. However, this factor does not appear to be nearly as significant as it is commonly assumed to be. While it would undoubtedly be desirable if the time involved in the litigation process were reduced, it is unlikely that such a change would bring about any dramatic improvement in the lot of the whiplash victim.

VII LEGAL IMPLICATIONS OF RESULTS

The basic principle of assessing damages in the common law is that of reparation; so that any injured parties may receive as legal redress a sum of money that will, as closely as possible, place them in the same position as if they had not sustained the wrong for which they now seek compensation.⁴⁹ This is the theoretical ideal which our courts presumably strive to attain. All those who are involved in a legal system are perfectly aware, however, that the law is not so much a perfectly integrated system of "pure" concepts, but rather an imprecise "social" organism. Nowhere is this lack of precision more evident than in the law relating to personal injury awards.

Compounding the difficulty is that anomaly introduced into the law by the English; namely the broad area known as "general damages", those that by their very nature are incapable of exact computation. It is within the rubric of *general*, as opposed to special, damages that monetary awards for "pain and suffering" are ascertained. It follows, therefore, that any claimant seeking compensation for the pain and suffering inflicted by a soft tissue type of injury (of which "whiplash" is only one example), must rely perforce, almost entirely on judicial discretion.

The basic question, of course, is what is the best method of exercising this mythical ideal; that of eliciting a reasoned response with a judicial framework. It is a problem confronting not only our judges but all others who may be engaged in the decisional process, whether they be lawyers, adjusters or members of administrative tribunals. Very few of use are graced with the wisdom of Solomon - our ability to "intuit" must be buttressed by supplementary sources. There has been a marked paucity of scientifically objective material that could be utilized in this area. The lesson to draw then, is obvious; we must make the best use of whatever resources are made available to us. Hopefully the material that has been presented in this paper will to some extent serve to bridge the gap that previously existed between the purely theoretical on the one hand, and a practical application of "hard" facts, on the other. Within a legal (as opposed to a psychological) context the authors believe that many of the statistical findings are highly significant.

The first major conclusion to be drawn is that "whiplash" is a severely debilitating injury in that it covers a broad spectrum of deeply felt physical and emotional complaints. In almost all instances that we investigated the symptomology is of long lasting duration. We all have a tendency to look at things from our own perspective, and all those who were engaged in this project couldn't help but conclude, in at least those instances where any party felt themselves sufficiently aggrieved to go through the bother of instituting a formal lawsuit, their complaints were substantially validated as being in accordance with the above noted observations. The salutary lesson was that in too many instances in the past the courts have had a tendency to minimize the after-effects of the "whiplash" type of injury.

We do not mean to assert that this is *invariably* the resultant effect of such an injury. There were certainly instances we ran across that established otherwise; but these were so isolated as to prove statistically non-significant. It is here where the expert legal "feeling" of judges and lawyers can come into play, for surely those that have had some experience in this field should be able to discern whether or not a plaintiff has a reasonable cause of action. A basic rule of evidence in civil proceedings is that a litigant must establish his claim "by a preponderance of evidence", this is his primary burden. The discernment of this initial

obligation of the plaintiff we leave to the common good sense and trained insights of our judiciary.

We found ourselves unable to flatly conclude that whiplash victims were by and large a self-selected group with a neurotic predisposition. The minutiae of our findings, as well as the major conclusion are self-evident—the graphs and statistical data are set forth so that they can be examined in exhaustive detail. What is important is that the symptoms manifested by our interviewees were substantially “real” to them whether they were emotionally or physically engendered. It is not within the scope of this paper to delve intensively into the jurisprudential aspects of “foreseeability” in our torts law. Most lawyers would agree that the “thin skull” rule is firmly established in the report decisions. By and large, a defendant “must take his victims as he finds them”. In the absence of any fairly pronounced intervening cause, these latterly noted observations can only augment any conclusions to be drawn.

What also emerged of prime importance from our research is that we had succeeded in answering our basic question, i.e., in the bulk of the accident cases that were investigated by us we concluded that the “compensation syndrome” did not play a significant role. With the exception of approximately 25% of the subjects interviewed, there was little, if any, cessation of physical and mental complaints subsequent to the payment of a monetary award. Neither did the *quantum* of damages assessed appear to have any bearing on the final outcome. This, in itself, is highly significant. It is true that there was improvement in the condition of one-quarter of the “whiplash group” and to some observers this might appear to be numerically substantial. However, we believe that our research should be thoroughly analyzed in the light of established legal and statistical principles before arriving at any broad-ranging conclusions on this point.

Firstly, it should be observed that the investigators were unable to establish what circumstances actually brought about this decline of symptoms in the group in question. It is difficult to say whether the final payment of a damage award acted as a true palliative or not - our findings would appear to indicate otherwise. Secondly, the abatement of tension after the unpleasant experience of a lawsuit may or may not have been a crucial factor here - the present state of scientific methodology in this regard could not give us a definitive answer. Thirdly, referring back to our actual findings, one should note that apart from this particular group of 30 persons, the average drop in score was 1.6 points, a mathematical figure that could not, by any stretch of the imagination, be deemed a gross one. Over a total possible score of 60, this works out to be 2.7%.

Fourthly, looking at the matter in contention from a legal point of view, it is obvious that anyone placed in a position of adjudication (particularly a trial judge) is confronted by two possible avenues of approach. On the one hand, there is a 25% possibility that the “compensation syndrome” may have some bearing as to whether the condition of a specific litigant will improve post-trial. On the other hand, there is a 75% possibility that the litigant’s condition will not differ markedly from that at the time of the trial. Note the usage of the term “possibility,” which is not as mathematically forceful as the term “probability”. Probabilities are possessed of much more certitude than mere possibilities. There are numerous instances in civil litigation where a plaintiff must surmount yet a second obstacle after having established his case by “a preponderance of evidence”. The evidence adduced might be sufficient as to weight, but it might still be open

to interpretation, particularly when there is a problem of the *application* of the evidence in cases of possible ambiguity. The second basic evidentiary rule devised by our juridical system in order to resolve this type of dilemma is known as "the balance of probabilities." That is, if there are two or more avenues of approach open to a trier of the facts, then the evidence adduced must be interpreted by him in light of the most likely probability. The "balance of probabilities" doctrine is yet one more example of pristine theory that is more easily expounded than pragmatically applied. However, we are fortunate in that there should be no difficulty of application in the context of the "compensation syndrome". Looking at the statistical data once again, it is evident that there is a weighting factor of 3:1 (75%, as opposed to 25%) in favour of discounting the "compensation syndrome" completely in the assessment of any damage award. On the overall "balance of probabilities", therefore, the compensation syndrome should be quietly laid to rest. Of course this is true only in those cases where this particular factor is either ambivalent, or where the evidence is silent on the point. There will undoubtedly be instances where the compensation syndrome should be taken into account as a mitigating factor in the computation of quantum of damage, but these would only be the obvious ones that could be dealt with in the ordinary course of events by the simple application of reasoned judicial discernment.

There is one final area in which our findings could prove of substantial assistance in the legal realm, and that is in the interpretation of the biographical data of the subjects interviewed. It is obvious that to a certain extent occupational background, age, education, ethnic background and sex can have some bearing on a person's propensity to recover from a soft-tissue injury. However, there is some inherent danger here in the possible interpretation of these findings. The thin ice is obvious - it has always presumably been the policy of the law to work against perpetrating possible injustice. Positive judicial attitudes invariably prove preferable to negative bias.

Those that have engaged extensively in bodily injury trials are aware that once negligence or culpability has been established, the assessment of damages is the inevitable aftermath. The format of doing this is often highly predictable. It can become, quite often almost a formal litany where the plaintiff's injuries are categorized and damages are then assessed by reference to past court awards for similar types of injuries. This method is not without merit - it does serve to provide some useful guidelines to all those who are involved, either directly or indirectly, in this decisional process. Nevertheless, it is time that we closely scrutinized some of the hallowed benchmarks that have been used in the past. There is cogent evidence to suggest that some of them may be very tenuously based.

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