

**BACKGROUND PAPER
FOR PREPARATION OF ONTARIO PAF GUIDELINE
WHIPLASH ASSOCIATED DISORDERS I & II**

PRE-APPROVED FRAMEWORK GUIDELINE PROJECT

***PREPARED BY
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I. Introduction, Background and Project Scope

In August 2005, the Superintendent of Financial Services (Acting) released a letter announcing the Pre-Approved Framework (PAF) Guideline Project's creation. The Project involves the development and introduction of new PAF Guidelines, which are used to treat individuals injured in automobile accidents who fall under the *Statutory Accident Benefits Schedule* regulation of the Ontario *Insurance Act*.

The Superintendent's letter, dated August 24, 2005, explained that the PAF Guidelines are designed to include treatment guidelines and fee schedules that will:

- Speed up access to rehabilitation for persons involved in auto accidents;
- Improve utilization of health care resources; and
- Provide certainty around cost and payment for insurers and health care providers.

It was further explained that the introduction of additional PAF Guidelines is FSCO's response to a key government commitment regarding the delivery of auto insurance in Ontario and is one of FSCO's strategic priorities identified in its Statement of Priorities. The Superintendent's letter also indicated that FSCO issued a Request for Proposal and awarded the contract to the Corporate Health Group (CHG). The CHG's role is to provide consulting support and assistance to FSCO to develop new PAF Guidelines.

The first PAF Guideline Project activities related to the development of the project's organizational structure which included clarifying reporting relationships, advisory functions and establishing the following committees:

- **The Project Management Committee** made up of representatives from FSCO and the Corporate Health Group;
- **The Project Advisory Committee** made up of representatives from various stakeholder groups.

Based upon consultation with these two committees, it was decided that the scope of the first PAF Guideline review would focus on Whiplash Associated Disorders (WAD) as described below:

ORIGINAL SCOPE

The first PAF Guideline review will involve exploration of how to improve upon the existing WAD I and WAD II PAF Guidelines in terms of processes and administration as well as the potential inclusion in the PAF Guideline of:

- WAD III;
- An extended timeframe; and
- Psychological impacts and treatment of whiplash injuries.

It was also agreed that any expansion of the existing WAD I and WAD II PAF Guidelines would need to be supported by scientific evidence.

Once the first PAF Guideline priority was identified, Project Advisory Committee members were asked to nominate individuals to participate in a **Technical Working Committee**. It was suggested that nominees to this committee would ideally have:

- Clinical and/or adjudication expertise;
- Knowledge and expertise in the treatment of WADs;
- Familiarity with the healthcare and/or insurance industry; and
- Background, knowledge and expertise to effectively:
 - Review and confirm the outcome of the literature review;
 - Advise the consultants on gaps in the scientific literature;
 - Advise on the expected course of treatment to support the PAF Guideline;
 - Advise on operationalizing the PAF Guideline; and
 - Advise on evaluation of the PAF Guideline.

During the Technical Working Committee's first meeting, the CHG informed members that a review of the scientific literature was being undertaken. Members were presented with a preliminary reference list and literature review. They were then invited to submit additional references for possible inclusion in the Background Paper.

The CHG reviewed all the literature forwarded by the Technical Working Committee members. The literature review revealed that there is limited scientific evidence to support the expansion of the existing PAF Guidelines to include:

- WAD III;
- An expended timeframe; and
- Psychological impacts and treatment of whiplash injuries.

As a result, the Technical Working Committee recommended that the first PAF Guideline's scope be revised. The Project Advisory Committee, on May 5, 2006, endorsed the revised scope described below:

REVISED SCOPE

The first PAF Guideline review will be focused on acute and sub-acute WAD I and WAD II injuries and will involve exploration of how to potentially improve upon the existing WAD I and WAD II PAF Guidelines in terms of processes and administration. The development of the first PAF Guideline will involve a review and synthesis of:

- Feedback and recommendations from stakeholders (i.e. healthcare providers, insurers and lawyers) regarding their experience with the existing PAF Guidelines;
- Feedback and recommendations from the PAF Evaluation Committee who undertook the evaluation of the existing PAF Guidelines; and
- Scientific literature related to the assessment and treatment of WAD I and WAD II.

The Background Paper and information presented here has been amended to reflect changes recommended by the Technical Working Committee and to be consistent with the revised scope.

II. Purpose of the Background Paper

The purpose of the Background Paper is to:

- summarize the literature that serves as a foundation for the existing WAD I and WAD II PAF Guidelines; and
- introduce additional literature that will assist in the improvement of the existing WAD I and WAD II PAF Guidelines.

The primary question to be addressed in the Background Paper is:

“What types of interventions have been demonstrated to be effective in the assessment, treatment and management of patients with WAD I and II type injuries in the acute/sub-acute phase of recovery?”

Specifically, the Background Paper will present:

- A review of the existing WAD I and WAD II PAF Guidelines;
- The methods and strategies used for the literature review; and
- The findings of the literature review with respect to:
 - The classification and incidence of WAD;
 - The prognosis for recovery following a WAD;
 - The psychological correlates of WAD;
 - The assessment of WAD; and
 - The treatment of WAD.

On the recommendation of the Project Advisory Committee, the CHG also gathered additional information that was seen to be useful for the introduction of the new PAF Guidelines in Ontario. This information is presented in the appendices to this document, as follows:

- **Appendix A - Existing Clinical Practice Guidelines** which summarizes seven existing clinical practice guidelines; and
- **Appendix B - Interviews with Other Jurisdictions** which summarizes the findings of interviews conducted with seven organizations/jurisdictions in which clinical practice guidelines have been introduced.

The purpose of gathering this information, and including it in the Background Paper, was to facilitate a greater understanding of issues associated with the implementation of clinical guidelines. The findings should not be considered scientific or evidence-based. Rather, the information is intended to provide an insight into how clinical guidelines have been implemented in other parts of

Canada and around world and their relevance for Ontario. As such, these findings are included as supplemental information only.

III. Methods and Strategy used for the Literature Review

There is considerable literature and research related to neck pain and whiplash associated disorders. Given the scope of the PAF Guideline Project's scope, the strategy recommended by the Evidence-Based Medicine Working Group (2002) was employed to review and summarize the scientific literature. The strategy starts with a review of systematic reviews undertaken by other individuals or organizations in which methodologically strong studies are evaluated.

In addition, based upon the Technical Working Committee feedback, it was decided that the review would also include:

- Studies related to prognostic and risk factors that have been shown to impact recovery from injury;
- Conservative management of WADs, mechanical neck disorders, neck disorders with radiculopathy, neck disorders with headache, and neck pain;
- The Acute and Sub-Acute phases of WAD to about three months after injury;
- Systematic reviews such as those undertaken by the Cochrane Collaboration;
- Other high quality studies that were deemed worthy of consideration; and
- Other high quality studies that have been published more recently than the systematic reviews.

It is important to note that the CHG did not systematically review the literature but rather summarized reviews and studies undertaken by other researchers. As a result, the Background Paper's content represents a narrative summary of research pertaining to whiplash injuries and mechanical neck disorders in the acute/sub-acute phase.

Throughout the Background Paper, the type of study (e.g. Cochrane Review, systematic review, randomized controlled trial, cohort study, prospective study, and longitudinal study) is explicitly referenced to aid the reader's review process and the assessment of the related conclusions. Background Paper studies that do not pertain specifically to WAD I and WAD II injuries in the acute/sub-acute phase are also explicitly noted and caution should be exercised in their interpretation.

IV. Review of Existing Ontario PAF Guidelines

Given that the revised Project Scope is focused on potential improvement to the existing WAD I and WAD II PAF Guidelines, the content of these Guidelines is summarized below. The WAD I and WAD II PAF Guidelines are referenced in the *Statutory Accident Benefits Schedule (SABS)* and are issued by the Superintendent of Financial Services. They were introduced in July 2003 and were revised in September 2003 and January 2006.

The WAD I and WAD II PAF Guidelines include a description of the goods and services and associated fee schedules that are available without insurer prior approval. They are designed to speed access to rehabilitation, improve utilization of health care resources, and provide certainty around cost and payment for insurers and health care providers. Specifically, they identify a set of services for the treatment of WAD I and II which insurers will pay without prior approval.

WAD I PAF Guideline

The Guideline's focus is on maintaining normal activities and reducing the risk of chronicity. From the outset, the insured person is encouraged to maintain normal activities. The emphasis in the first week is on assessment, education, reassurance, and pain control. Throughout the treatment, emphasis is placed on the insured person being in charge of his/her recovery and on carrying on with normal activities. The frequency of health care provider interventions diminishes as the insured person progresses in the PAF.

If prescription medication is needed, a referral to a physician or nurse practitioner is necessary. Regulated health professionals may provide general information on the use of over-the-counter medications, but insured persons are encouraged to consult a physician, nurse practitioner, or pharmacist on the specific use of these medications.

Treatment for WAD I has a maximum duration of 28 days. The course of treatment may involve the following:

- Reassurance;
- Pain control;
- Mobilization/manipulation;
- Education; and
- Activation (normal daily activities and active exercise).

The importance of positive messaging is recognized. It is therefore expected that, during the initial visit/assessment and during all subsequent visits, the insured person is provided with:

- Education that "hurt does not equal harm"; and
- Reassurance that most people with WAD I and associated complaints of back symptoms recover within the first few weeks following the injury.

An education brochure titled "Getting the Facts About Whiplash", developed by regulated health professionals and the insurance industry, is provided to all insured persons covered by this Guideline.

If the insured person recovers before the completion of the treatment outlined in this Guideline, the insured person is discharged from treatment.

WAD II PAF Guideline

The focus of the WAD II PAF Guideline, as with the WAD I PAF Guideline, is on maintaining normal activities and reducing the risk of chronicity. The emphasis in the first week is on assessment, education, reassurance, and pain control and may also include physician referral for prescription medication. If treatment is initiated during the first 7 days following an accident, the duration of treatment is 7 weeks. If treatment is initiated between 8 and 28 days following an accident, the duration of treatment is 6 weeks.

The course of treatment may involve the following:

- Reassurance;
- Pain control;
- Mobilization/manipulation;
- Education; and
- Activation (normal daily activities and active exercise).

The importance of positive messaging is recognized. It is therefore expected that, during the initial visit/assessment and during all subsequent visits, the insured person is provided with:

- Education that “hurt does not equal harm”; and
- Reassurance that most people with WAD II and associated complaints of back symptoms recover within the first few weeks following the injury.

An education brochure titled “Getting the Facts About Whiplash”, developed by regulated health professionals and the insurance industry, is provided to all insured persons covered by this Guideline. Emphasis is placed on the insured person’s responsibility for his or her recovery and the return to normal activities. The frequency of goods and services diminishes as the insured person progresses in the PAF. If prescription medication is needed, a referral to a physician or nurse practitioner is necessary. Regulated health professionals may provide general information on the use of over-the-counter medications, but insured persons are encouraged to consult a physician, nurse practitioner, or pharmacist on the specific use of these medications.

V. Findings of the Literature Review

1. Classification and Incidence of Whiplash Associated Disorders

Whiplash is the most common type of injury that arises out of a motor vehicle accident in Ontario and in other jurisdictions.

Historically, a lack of consensus existed regarding the definition of whiplash. Furthermore, the term “whiplash” has been used to describe many different things including the process by which the injury occurred, the injury itself, and various clinical manifestations accompanying the injury.

An important advance to address this problem was made when the Quebec Task Force (QTF) on Whiplash Associated Disorders formulated the following definition of whiplash:

Whiplash is an acceleration-deceleration mechanism of energy transfer to the neck. It may result from rear end or side impact motor vehicle collisions, but can also occur during diving or other mishaps. The impact may result in bony or soft-tissue injuries (whiplash-injury), which in turn may lead to a variety of clinical manifestations called Whiplash-Associated Disorders. (Spitzer, et al., 1995).

The QTF also identified different grades of Whiplash Associated Disorders that allowed patients to be classified by their signs and symptoms. This QTF WAD classification is presented in Table 1.

Table 1 – Quebec Task Force Classification of WAD Grades

WAD GRADE	SIGNS AND SYMPTOMS
0	<ul style="list-style-type: none">No complaints of painNo physical signs or findings
I	<ul style="list-style-type: none">Complaints of pain, stiffness and tendernessNo physical signs or findings
II	<ul style="list-style-type: none">Complaints of pain, stiffness and tendernessMusculoskeletal signs such as a decreased range of motion or muscle weakness
III	<ul style="list-style-type: none">Complaints of pain, stiffness and tenderness in the neckNeurological signs such as decreased or absent reflexes, weakness and sensory deficits
IV	<ul style="list-style-type: none">Complaints of pain, stiffness and tenderness in the neckFracture or dislocation of the neck

According to the QTF report, while neck pain, stiffness and tenderness and decreased cervical mobility are the most common symptoms associated with an acute WAD, other symptoms that may occur in all WAD Grades include hearing disturbance, visual disturbance, sleeping problems, dizziness, headaches, memory loss, dysphagia and jaw pain. A weakness of the QTF WAD classification is that it does not take into account the severity of pain and disability, which are important prognostic factors for recovery.

2. Prognosis

The topic of WAD prognosis has been the subject of several systematic reviews. These reviews have attempted to identify factors that will predict the eventual outcome in persons who have experienced a whiplash injury. One challenge with the assessment of these reviews is the heterogeneity of the outcome measures used, including pain, return to work, and claims duration. As not all studies use the same outcome measures, it makes it difficult to compare the findings across studies.

The QTF (1995) concluded that the scientific evidence was of insufficient quality to define specific prognostic factors. They did however present the following general findings with respect to prognosis among claimants in Quebec:

- 50% of claimants will return to usual activity by 31 days post injury;
- 25% of claimants are off work between 2 and 6 months post injury;
- 12.5% of claimants are off work at 6 months post injury;
- 1.9% of claimants are off work at 1-year post injury.

Coté et al. (2001) undertook a systematic review regarding the prognosis of acute whiplash. They concluded that older age, female gender, baseline neck pain intensity, baseline headache intensity, and baseline radicular signs and symptoms were prognostic factors for a slower recovery from whiplash.

In a cohort study of 125 patients with a Grade I and II WAD who still had neck pain and accompanying complaints two weeks after the accident, Hendriks et al., (2005) found that high initial pain intensity was an important predictor for delayed functional recovery among patients with whiplash injuries. The primary outcome measure was functional recovery, which was defined in terms of neck pain intensity or work disability without medication use. The outcomes were assessed at 4, 12 and 52 weeks after the accident. One year after the injury, 64% of the patients had recovered. Factors related to poor recovery were female gender, a low level of education, high initial neck pain, and more severe disability, higher levels of somatisation and sleep difficulties. Based upon these findings, the authors proposed that healthcare providers could identify patients at risk for poor recovery by using a

visual analogue scale of initial pain intensity and work-related activities. Pobereskin (2005) investigated the factors that predicted the experience of neck pain at one year following a rear end collision in a prospective cohort study. A total of 1,147 people reported rear end collisions to the police during the study period and 503 (44%) agreed to take part in the study. Of the respondents, 78% had neck pain lasting more than a week and 52% still had pain at 1-year post accident.

In their prospective review, Tomlinson et al. (2005) reported on a 7.5-year follow-up of 42 subjects with whiplash injuries. These subjects were assessed at the time of their injury, and then again after 3 months, 2 years, and at 7.5 years post injury. The measurements included pain and functioning. Tomlinson et al. reported that symptomatology was established by 3 months and that at 7.5 years the majority (64%) of patients had the same symptom severity as they did at 3 months - suggesting the highly predictive nature of early symptoms on long-term prognosis.

A longitudinal evaluation of whiplash victims was carried out by researchers at the Whiplash Research Unit of the University of Queensland Department of Physiotherapy (Sterling et al. 2005). The goal of the study was to identify prognostic factors for failure to recover by 6 months post injury. Study subjects (N = 76) were recruited via hospital emergency rooms, primary care practices and through advertisements. Recruits were eligible for inclusion in the evaluation if they had a WAD II or III and had suffered their injury less than one month prior to inclusion. Twenty control subjects without neck pain were recruited by print advertisement from the general community. Physical and psychological measurements were undertaken at 1, 2, 3 and 6 months post-injury. The main outcome measure was neck-related disability, as evaluated with the Neck Disability Index (NDI; normalized to a 100 point scale from a 0-50 point scale) (Pietrobon et al., 2002). Other measures included a 10 cm visual analogue scale of neck pain. The researchers did not provide therapy to the research subjects. Rather, subjects were managed by other health care providers. Approximately 50% of subjects received treatments, primarily from physiotherapists. Recovery was defined according to the score on the NDI using the following definitions of disability:

- A score less than 10 = no disability;
- A score of 10-28 = mild disability;
- A score of 30-48 = moderate disability;
- A score of 50-68 = severe disability; and
- A score above 68 = complete disability.

An assessment at 6 months post accident revealed that 29 subjects (38%) had recovered (no disability); 30 subjects (39%) had mild pain and disability; and, 17 subjects (22%) had moderate to severe pain and disability. Further, it was determined that those subjects who recovered had received 10.6

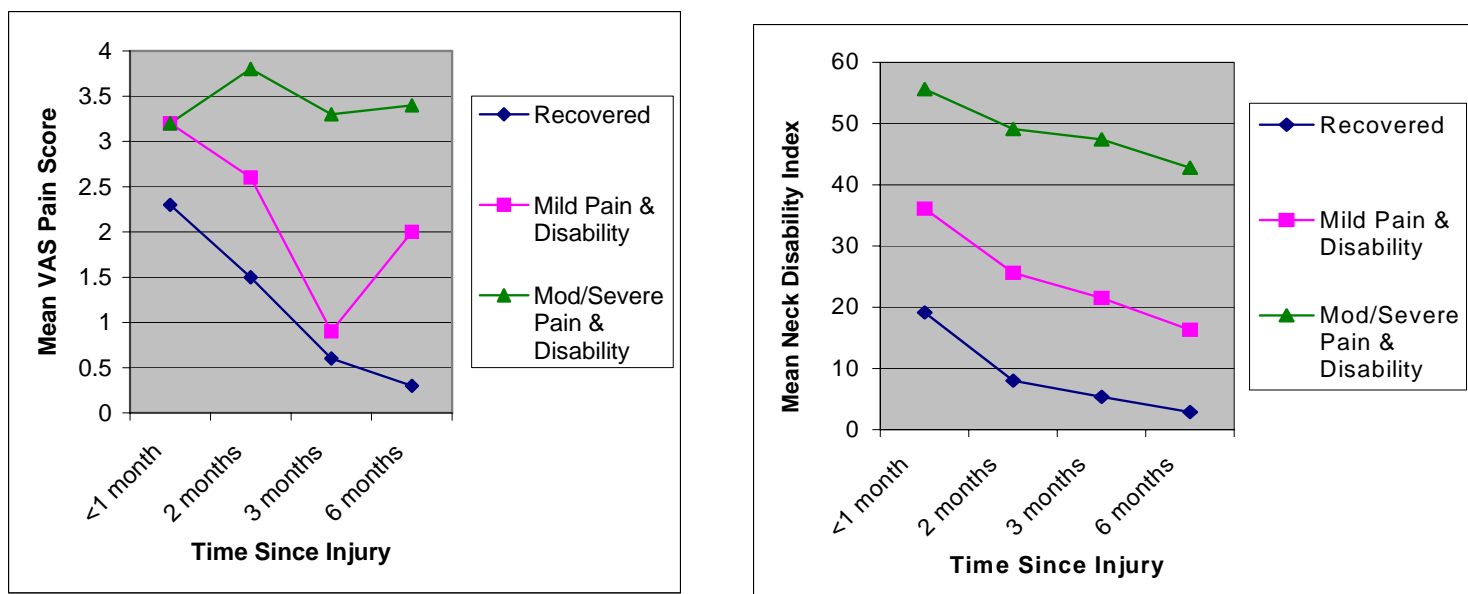
treatments on average, those with mild symptoms had received 14.4 treatments on average, and those with moderate/severe symptoms had received 18.4 treatments on average.

The researchers found that those subjects who completely recovered had the lowest NDI and pain scores within 1 month of the accident. Those who were moderately to severely disabled at 6 months had high initial scores, and these scores remained elevated throughout, indicating the predictive utility of early disability scores.

The researchers also compared the symptoms among subjects in the three recovery groups. At baseline, those subjects who did not recover had widespread complaints of pain. In addition, complaints of paresthesia and dizziness were common. The researchers administered psychological tests including the 28-item General Health Questionnaire (GHQ-28). Those who failed to recover by 6 months were more distressed at baseline and remained distressed throughout. Based upon regression modeling of the various factors, the researchers determined that both physical and psychological factors were associated with ongoing disability at 6 months post injury. In addition, they concluded that higher initial NDI score, older age, and acute post-traumatic stress were associated with membership in the moderate/severe disability group.

Figure 1, below, shows the longitudinal progression of the Mean NDI scores (right) and the Mean VAS pain scores (left) in each of these groups. It is clear from these figures that those subjects who were completely recovered had the lowest NDI and pain scores within 1 month of the accident. Those who were moderately to severely disabled at 6 months had high initial scores, and these scores remained elevated throughout.

Figure 1 – Prognostic Factors for Failure to Recover at Six Months Post Injury



Based on the preceding literature, it would seem that the most important factors in determining the prognosis of an individual with a WAD is the intensity of initial pain, disability (NDI), and initial psychological distress.

3. Psychosocial Correlates

Whiplash is a complex, multifaceted disorder involving varying degrees of physical and psychological disturbances (Sterling, 2004). However, the psychosocial correlates that are associated with whiplash injury have not been well studied when compared with other symptoms that typically accompany WAD.

It has been proposed that individuals who are psychologically vulnerable will be more susceptible to developing chronic whiplash pain (Mayou and Bryant 2002). However, it has also been proposed that psychological distress may be a consequence of ongoing pain and disability rather than a separate impairment or the cause of the pain. Barnsely, (2004) found that psychological distress associated with a WAD is secondary to the effects of the injury and related limitations in functioning. Further, this researcher found that the relief of pain resulted in the resolution of psychological distress.

Given the multifaceted nature of WAD, biopsychosocial models of pain are viewed by many as superior to the traditional biomedical model in the assessment and treatment of WAD pain. The biomedical model focuses on assessment of a physical basis for the pain. When a physical basis is absent, insufficient or has not been identified, it is assumed that causation is psychological (Victor and Richeimer, 2003). In contrast, biopsychosocial models of pain emphasize the subjective experience that results in physical discomfort, emotional distress, functional limitations, and psychosocial disruption. Biopsychosocial models focus on how the patient, family members, and the social network receive and respond to the consequences of the symptoms and considers the impact of psychological, cognitive, social, and stress factors, as described below (Victor and Richeimer, 2003):

- **Psychological Factors** include the affective components of pain (e.g. depression, anxiety, and anger). These components can increase autonomic arousal, which can cause a chain reaction of increased release of adrenaline and noradrenaline, activation of damaged or sensitized pain neurons, and increased pain. These emotions can also lead to decreased energy and motivation to participate in treatment, thus complicating the rehabilitative process.
- **Cognitive Factors** include the various thoughts related to pain such as a belief that the cause of the pain may be unknown or undetected or that it is the result of a malignant disease process. Cognitive factors may also include unrealistic goals for treatment and negative thinking styles

(e.g. catastrophizing, inadequate and maladaptive coping strategies, lack of a sense of self-efficacy). These cognitive factors can make treatment ineffective and can contribute to significant elevations in pain, and have also been related to sympathetic nervous system activation, increased skeletal muscle tone, spasm, and pain.

- **Social Factors** include social learning, sources of inadvertent and direct reinforcement of pain, current or recent stressors, and compensation or litigation issues. Social learning factors are the attitudes about health, pain, and appropriate responses to injury or illness that one learns from one's parents and social environment, which determine whether one is likely to ignore or over-respond to symptoms. Sources of inadvertent reinforcement for pain behaviors include the avoidance of aversive situations or activities, such as doing housework, returning to a job that was disliked, or having sex with one's spouse when sex was previously disliked. Inadvertent reinforcement may also occur in the form of attention, assistance, or expressions of caring by significant persons in the patient's life. Direct reinforcement of pain behaviors often results from anticipatory pain and thus immobilization or total deactivation of the affected part. Although the immediate avoidance of increased pain is gratifying, the ultimate consequence is escalating loss of strength, stamina, or function.
- **Stress Factors** includes other things that are occurring within the patient's life at the same time that they are trying to manage the pain or disability. That is, the patient may be trying to cope with the illness, death, divorce, or another adverse event in the life of a family member or close friend. The patient may be experiencing significant financial problems, social isolation, cognitive limitations secondary to medication, or a host of other life problems, all of which combined have drained the patient's coping resources and sabotaged the patient's ability to benefit from treatment.

4. Assessment of Whiplash Associated Disorders

Based upon a review of relevant literature, the initial assessment of a WAD is typically made by the first health-care professional to attend the patient and is likely to be repeated, in whole or in part, by subsequent health care providers as part of the treatment planning, monitoring, modification and delivery process. The first assessment of individuals who have a WAD generally includes:

- History and description of the patient's overall situation;
- Physical examination;
- Assessment of psychological distress by a physical practitioner; and
- Investigations as appropriate.

Each of these elements is described in more detail below including recommendations reflected in the literature. It is noteworthy that the majority of recommendations are based upon consensus rather than scientific evidence.

A. History and Description of the Patient's Overall Situation

The literature review revealed what is typically included in the history that is taken by physical assessors, as reflected below.

Scholten-Peeters et al. (2002), in their guideline for physiotherapy with WAD, recommended that a systematic history should be taken concerning:

- Impairments (e.g. pain, concentration, mobility of the neck, dizziness);
- Disabilities (e.g. changing or maintaining position, walking);
- Participation problems (e.g. social relationships, work, housekeeping); and;
- Prognostic factors.

Specifically, they proposed that the key points in history-taking should include:

- Inventory of specific symptoms and accounts of the patient;
- Pre-existing symptoms, disabilities, and participation problems;
- Accident-specific information (e.g. velocity of the car, rear-end collision);
- Previous diagnostic tests and procedures;
- Success of past medical or therapeutic treatment;
- Attitude, cognitions, beliefs and internal control of the patient;
- Coping strategy;
- Waddell's signs;
- Present severity of symptoms;
- Present treatment; and
- Medication use.

The New South Wales Motor Accidents Authority (MAA) (2001) updated the recommendations made by the QTF (Spitzer, et al., 1995) for history-taking and specifically proposed that the following elements should be covered by a physical assessor gathering historical information on a patient who has a whiplash injury:

- Demographics:
 - Date of birth;
 - Gender;
 - Occupation;
 - Number of dependants; and
 - Marital status.

- Prior history of neck problems including previous whiplash injury;
- Prior history of psychological disturbance;
- Prior history of long-term problems in adjusting to symptoms of an injury or illness;
- Current psychosocial problems (e.g. family, job-related, financial);
- Symptoms including localization, time of onset and profile of onset:
 - Pain;
 - Stiffness;
 - Numbness;
 - Weakness; and
 - Associated extra-cervical symptoms.
- Circumstances of injury (e.g. sport, motor vehicle) and mechanism of injury:
 - Head movement (e.g. forward, backwards, sideways);
 - How the accident occurred;
 - Where the injured patient was positioned in the car;
 - Type of vehicle; and
- Results of assessments of general psychological state and pain and disability using standardized measurement tools (e.g. General Health Questionnaire, a visual analogue scale of pain intensity, Neck Disability Index). It is noteworthy that the assessment of general psychological state may result in the identification of a subset of patients who require a referral for a more specialized assessment.

With respect to history taking, the consensus of the Australian Acute Musculoskeletal Pain Guidelines Group (2003) was as follows:

- Attention should be paid to the intensity of pain, as it is a prognostic risk factor for chronicity and patients with severe pain which may require special or more concerted interventions;
- The serious causes of acute neck pain are to be found in the nature and mode of pain onset, its intensity and alerting features; and
- Eliciting a history aids the identification of potentially threatening and serious physiological causes of acute neck pain and distinguishes them from non-threatening causes.

The preceding references suggest that there is general agreement that a history and description of the patient's overall situation should be taken with WAD patients as part of the overall assessment process.

B. Physical Examination

The MAA (2001) reviewed the recommendations made by the QTF (Spitzer et al. 1995) regarding what should be included in a physical examination of a patient with a WAD. They reviewed more recent studies in updating the QTF recommendations. Specifically, the MAA group suggested that a focused physical examination is necessary for all patients with a WAD injury. The

physical examination should include at least:

- Inspection;
- Palpation for tender points;
- Range of motion in flexion-extension, rotation and lateral flexion;
- Neurological examination to assess sensorimotor function and tendon reflexes of upper and lower limbs. In the absence of damage to the spinal cord, repeated examination of the lower limbs is unlikely to be of value;
- Assessment of associated injuries;
- Assessment of general condition as needed, including mood, affect and psychological state. Again, the general assessment of the patient's psychological state may result in the identification of a subset of individuals who require a more specialized assessment.

Based upon their review of the related evidence, the Australian Acute Musculoskeletal Pain Guidelines Group (2003) concluded that physical examination does not provide a patho-anatomic diagnosis of acute whiplash-associated neck pain as clinical tests have poor reliability and lack validity. Despite these limitations, the reviewers advocated physical examination as an opportunity to identify features of potentially serious conditions and added that tenderness and restricted cervical range of movement correlate well with the presence of neck pain.

The foregoing indicates general agreement that a physical examination is an important component of the assessment of WAD.

C. Assessment of Psychological Distress by a Physical Practitioner

Sterling (2004) cautioned that recognition of psychological impairments must not be overlooked in the assessment of WAD. She recommended an in-depth evaluation of both physical and psychological factors given the relationship between early post traumatic stress and the development of persistent whiplash symptoms. Sterling further proposed that psychological issues associated with WAD are best assessed using validated questionnaires that encompass a broad overview of psychological distress.

In general, the literature supports that screening for psychological distress can and should be undertaken by physical practitioners followed by referral to a regulated mental health practitioner/professional for patients who require a more in-depth psychological assessment.

It is acknowledged that it is neither practical nor necessary to undertake an in-depth psychological assessment with all patients.

D. Investigations

The MAA (2001) updated the QTF (Spitzer et al., 1995) recommendations regarding investigation of WAD injuries and specifically made the following recommendations with respect to investigation:

- A patient with a WAD I does not require a plain radiograph if he/she is:
 - Conscious;
 - Shows no signs of alcohol-related impairment;
 - Not obtunded by narcotics or other drugs; and
 - Not showing physical signs on examination.

- A patient with a WAD I does not require a plain radiograph unless he/she incurred the injury as a result of:
 - A high speed collision;
 - A high impact collision; or
 - A collision in which another occupant was killed.

- A patient with a WAD II requires a plain radiograph of the cervical spine if:
 - The severity of the signs on examination suggest the possibility of a bony injury;
 - The patient's level of consciousness or pain sensation is impaired by brain injury, alcohol or other drugs; or
 - The patient's has been involved in high speed or high impact collision or one in which another occupant has been killed.

- All patients with a WAD III require a baseline radiological investigation of the cervical spine including:
 - Anterior posterior, lateral and open-mouthed views; and
 - All seven cervical vertebral and the C7-T1 disc including flexion-extension views.

- There is no role for specialized imaging techniques (e.g. tomography, CAT scan MRI, myelography, discography, etc.) in patients with WAD I or II.

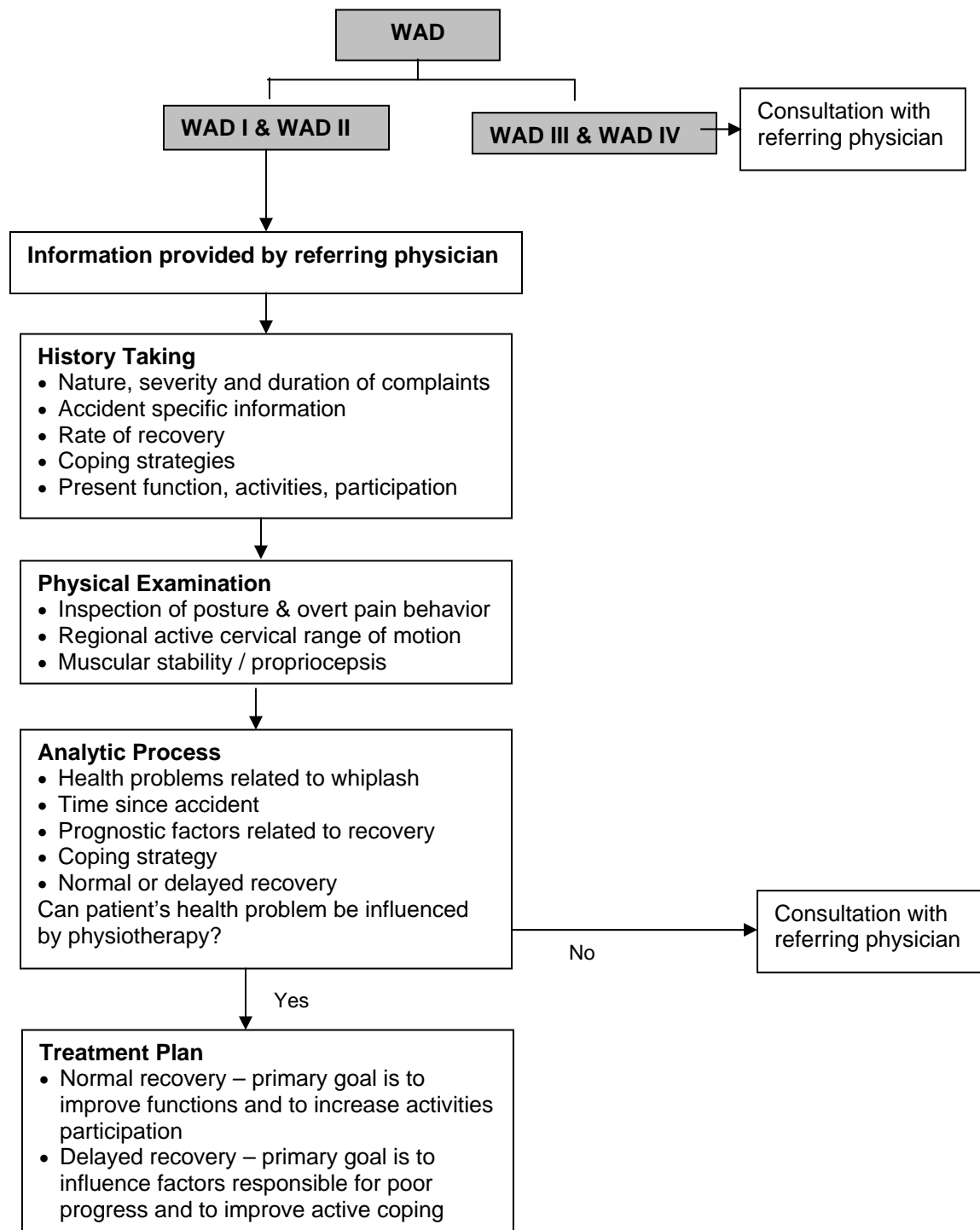
- In some cases, patients with a WAD III may require specialized imaging techniques such a MRI (e.g. cases with nerve root compression or suspected spinal cord injury or on the advice of a medical or surgical specialist).

- Patients with WAD I, II, and III do not require specialized examinations such as EEG, EMG, and nerve conduction testing.

In summary, the foregoing suggests that, in general, plain imaging is not required in WAD I, is required under certain circumstances in WAD II, and is required in all cases of WAD III. Specialized imaging such as CT and MRI is

only indicated in more serious cases of WAD, and EEG, EMG, and nerve conduction testing is not required. In considering the overall assessment of WAD and the dimensions described above, it is useful to review the diagnostic process proposed by Scholten-Peeters et al. (2002), as depicted in Figure 2.

Figure 2 – Scholten-Peeters et al. Diagnostic Process for Whiplash Patients



1. The Treatment of Whiplash Associate Disorders

A wide variety of interventions and modalities for the treatment of WAD have been used by therapists and studied by researchers. These are reported below:

A. Manual and Manipulative Therapies

Bronfort et al. (2004) undertook a systematic review and best practice synthesis of the literature regarding the use of manipulation and mobilization strategies for the treatment of neck pain.

These authors concluded that there was inconclusive evidence for the efficacy of use of manipulation or mobilization alone in the treatment of acute neck pain.

A Cochrane review of literature (Gross et al. 2004a) pertaining to manipulation and mobilization for mechanical neck disorders concluded that mobilization and/or manipulation, when used with exercise, are effective for pain relief, functional improvement and global perceived effect for sub-acute and chronic mechanical neck disorders with or without headache. However, manipulation and/or mobilization, when used independently, or combined with other treatments (e.g. heat) were not found to be beneficial. In addition, when compared to one another, neither mobilization nor manipulation was superior.

In summary, mobilization and/or manipulation, when used with exercise, are beneficial for sub-acute and chronic mechanical neck disorders with or without headache. The benefits to the population of WAD sufferers appear, however, to be modest (i.e. absolute benefit of about 25 points on a 0 to 100 point pain scale). For example, the Cochrane review (Gross et al., 2004a) and summary review (Gross 2006) indicated that between 2 and 5 individuals would have to be treated in order to produce this pain benefit in one individual. In addition, between 6 and 11 individuals would need to be treated to achieve functional benefit in one individual. The global perceived effect was 69% absolute benefit. None of the trials stratified the subjects according to prognostic factors, such as scores on measures of pain, disability, or psychological distress.

B. Exercise

The Cochrane Cervical Overview Group published a systematic review of exercises for mechanical neck disorders (Kay et al., 2005) and a summary review (Gross et al., 2006). The reviewers concluded there is a role for exercise in the treatment of neck pain and their review revealed moderate evidence of benefit for active range of motion or stretching exercises as well as home exercises for acute WAD pain relief. It was further determined that between 5 and 14 individuals would have to be treated in order to produce 23 to 41 mm change in pain benefits in one individual. Function was

not assessed in the primary trials.

The MAA (2001) updated the QTF (Spitzer, et al., 1995) while acknowledging the limited evidence base regarding the use of exercise in the treatment of WAD. Specifically, the MAA report recommended: range of motion exercises, muscle re-education and low load isometric exercise (to restore appropriate muscle control and support to the cervical region) in combination with intermittent rest when pain is severe.

In addition, as described in the preceding section of this document, a multimodal care approach in which exercise is combined with mobilizations or manipulations for sub-acute and chronic mechanical neck disorder, with or without headache, was associated with reduced pain, improved function and high global perceived effect in the short and long term (Gross et al., 2004a).

C. Advice to Rest

A Cochrane review undertaken to review patient education (Haines et al., 2006) noted that advice to rest resulted in deleterious effects for short and intermediate experience of pain as well as extended sick leave.

D. Use of Soft Collar

A summary Cochrane review (Gross et al., 2006) noted that soft collar use in acute WAD did not help pain relief in the short or long term and could result in extended sick leave.

E. Advice to Activate and Active Approaches to Treatment

Numerous randomized controlled trials have concluded that an active approach to treatment and the continuation of normal activities is superior to rest, immobilization or collar use.

A systematic review undertaken by Seferiadis et al. (2004) reviewed treatment interventions in WAD (through to the end of 2003). They concluded that “Early physical activity reduces pain, increases cervical range of motion and reduces sick leave in patients with acute WAD”. Based upon their review, they recommended that patients suffering from acute WAD be prescribed:

- Advice to “act as usual”; and
- Early, controlled, physical activity to tolerance level.

A review of more recent literature indexed in Medline confirms earlier reports that early mobilization is preferable to use of a soft collar (Crawford et al., 2004; Schnabel et al., 2004). Haines et al. (2006) concurred that advice to activate is superior to rest in reducing sick leave and short/long term pain

for patients with sub-acute mechanical neck disorder. However, it is important to note that in three trials that compared various forms of advice to activate with a no treatment control, advice to activate was similar (i.e. not superior) to the no treatment control in terms of short and long term pain reduction.

Verhagen et al. (2005) in their updated Cochrane Review of conservative treatments for WAD I and II, re-analyzed the original data from many studies. They first divided the different types of conservative interventions into passive types (e.g. heat, ice, neck collar, ultrasound, traction, massage) and active types (e.g. mobilization, exercise, multimodal treatment) to facilitate comparison to one another, to no treatment and to a placebo group. The outcome measures used in the comparison were pain relief at six weeks, and return to work at six months.

Based upon their re-analysis, Verhagen et al. found limited evidence that conservative treatments (both passive and active types) were more effective than no treatment. In addition, in contrast to an earlier version of this review completed by the same authors (Verhagen, et al., 2001), conflicting evidence was found with respect to the greater effectiveness of active interventions as compared to passive interventions in the treatment of WAD. The authors concluded that “When looking at the actual data presented in the current included trials, our conclusion from the previous version of this review, that 'rest makes rusty', can no longer be justified. There is a trend suggesting that active interventions are more effective than passive ones, but no clear conclusion can be drawn”. The authors explained that the difference in conclusion, when compared to their previous review, was due to the assessment of actual data as presented in the trials instead of relying on the trial authors’ conclusions. It is also noteworthy that there is some controversy regarding the use of return to work as a proxy measure for recovery and health outcome.

While there is clearly a trend towards a more active approach to intervention in the treatment of WAD, it would seem that the related research is not yet at the stage that this conclusion can be unequivocally made.

F. Massage

A Cochrane review of massage for mechanical neck disorders (Haraldsson, et al., 2006) identified one controlled trial (Irnich 2001), which showed no short-term effect on pain in the application of western massage to sub-acute mechanical neck disorder.

The use of massage in the treatment of WAD has not been fully studied. Moffett and McLean (2005) however proposed that in spite of the fact that the effectiveness of massage is under-researched and is therefore not usually recommended in clinical guidelines, on pragmatic grounds its use should not be discounted as preliminary to more active interventions.

G. Acupuncture

The three systematic reviews that have been undertaken regarding the use of acupuncture in the treatment of neck pain (White & Ernst, 1999; Smith et al., 2000; Triinh et al, 2006) did not include any trials on acute or sub-acute WAD and were challenged by the low quality of trials and the heterogeneity of the samples.

Based upon the lack of evidence regarding the effectiveness of acupuncture for WAD, the MAA (2001) Working Party recommended a regime of acupuncture can be used in WAD providing there is evidence of continuing improvement with the treatment.

H. Traction

A Cochrane review (Gross, et al., 1998) on physical medicine modalities for mechanical neck disorders concluded that there was not enough scientific evidence to determine the efficacy of traction for the management of this condition. An earlier systematic review (van der Heijden, et al., 1995) also concluded that there was insufficient evidence to determine if traction was an effective modality in the management of mechanical neck pain.

With the foregoing acknowledged, the MAA (2001) Working Party proposed that a regime of traction can be used in combination with other mobilizing modalities in WAD providing that there is evidence of continuing improvement with the treatment.

More recently, Graham et al. (2006) undertook a systematic review of mechanical traction for mechanical neck disorders. They found that there was moderate evidence suggesting intermittent traction may be beneficial for chronic mechanical neck disorder with radicular symptoms based on low quality trials. There were no trials found on acute or sub-acute WAD.

I. Electrotherapies

A Cochrane review (Kroeling et al., 2005) of electrotherapy for mechanical neck disorders reviewed literature related to the application of different types of electric currents and their putative therapeutic effect. The various electrotherapies reviewed were galvanic current, electrical nerve stimulation (TENS, modulated direct current), electrical muscle stimulation, pulsed electromagnetic field (PEMF) and permanent magnets.

The Cochrane reviewers concluded that, with respect to the reduction of pain, as well as other outcomes, the evidence for the use of electrotherapy in the treatment of acute or chronic mechanical neck disorder is either lacking, limited or conflicting. In addition, they found limited evidence that PEMF was associated with pain relief. Specifically, they found that PEMF resulted in

only immediate post-treatment pain relief for chronic mechanical neck disorder and acute WAD. Other findings included unclear or conflicting evidence.

In contrast with the Cochrane review summarized above, the Foley-Nolan et al. (1992) trial noted that if a PEMF device was worn for 8 hours per day for 12 weeks there was evidence of post treatment pain relief, increased range of motion and reduced analgesic use. Thuile and Wazl (2002) published a randomized controlled trial of PEMF with 92 subjects with whiplash injuries. The treatment subjects received PEMF in a cushion for 16 minutes, twice daily for 14 days. Control subjects received only medication therapy (without sham PEMF). At the end of the study, the subjects receiving PEMF treatment had significantly lower pain scores and greater neck mobility. Gross et al. (2006) calculated a NNT of 3, 57% treatment advantage and 44mm absolute benefit on a 100 point pain scale over a sham.

In summarizing the foregoing, there would seem to be general agreement regarding the absence of evidence for electrotherapies in the treatment of WAD. The only exception is PEMF, in which case, the literature suggests some evidence for post treatment pain relief and greater neck mobility. However, caution must be exercised given that the longer term effects of PEMF have not been studied.

J. Laser Therapy

With respect to laser therapy, Chow (2005) conducted a systematic review of randomized controlled trials on the application of low level laser therapy (LLLT) in the management of neck pain. She identified 20 studies up to February of 2004, five of which met the inclusion criteria. The review revealed limited evidence from one randomized controlled trial (Soriano et al., 1996) for the use of infrared laser in the treatment of acute neck pain. Gross et al. (2006) calculated an NNT of 3 with a 50% treatment advantage over the use of a sham.

There is limited evidence that supports the effectiveness of low level laser therapy in the treatment of acute neck pain.

K. Thermal Agents

One systematic review (Gross et al., 2006) identified 7 randomized controlled trials related to thermal agents including ultrasound, hot pack, infrared light, as well as vasocoolant spray and stretch. Only one of these trials was specific to acute WAD. Based upon this review, it was concluded that there is limited evidence suggesting that the use of ultrasound for acute neck pain is beneficial. Other thermal agents remain controversial due to the absence of trials.

L. Pharmacology and Medicinal Therapies

The Cochrane Cervical Overview Group published a systematic review of medicinal and injection therapies for mechanical neck disorder (Peloso et al., 2005) and found 8 trials on acute or sub-acute neck pain. The Cochrane reviewers concluded that intravenous injections of methylprednisolone for acute whiplash were effective treatments for pain relief and associated with fewer sick days over a 6-month period. Caution should however be exercised given that this conclusion is based upon a small study (40 patients) that did not assess the potential harm or side effects associated with the use of steroid medications. In addition, while intravenous injections of methylprednisolone have some limited evidence of benefit for individuals with acute whiplash, the cost effectiveness and practicality of this intervention needs to be carefully considered given that patients in the study were hospitalized and infused over a 23 hour period.

Oral psychotropic agents (7 trials) had mixed results for acute and sub-acute neck pain. There was no evidence specific to acute or sub-acute neck pain for other medicines or medical injections.

The MAA (2001) update of the QTF Report (Spitzer et al., 1995) resulted in the following summary with respect to pharmacological treatment of WADs:

- WAD I
 - No medication other than simple analgesics should be prescribed.
- WAD II and III
 - Non-opioid analgesics and non-steroidal anti-inflammatory drugs (NSAIDs) can be used to alleviate pain for the short term. Their use should be limited to three weeks and should be weighed against possible side effects;
 - Opioid analgesics are not recommended for WAD I and II but may be prescribed for pain relief in acute severe WAD III for a limited period of time;
 - Muscle relaxants should not generally be used in acute WAD;
 - Psychopharmacologic drugs are not recommended in WAD of any duration or grade; however, they may be used occasionally for symptoms such as insomnia or tension or as an adjunct to activating intervention in the acute phase;
 - Use of high dose intravenous methylprednisolone infusion for acute management of WAD I and II is not recommended.

M. Psychological Interventions

There is very limited research related to psychological intervention with acute or sub-acute WAD I and WAD II. Studies that have been completed have methodological flaws and tend to be focused on the treatment of chronic neck disorders. It is difficult to draw definitive conclusions due to the absence of trials regarding the psychological treatment for acute and sub-acute WAD.

However, in a recent cohort comparison study Sullivan et al. (2006) studied the application of a 10 week intervention (Progressive Goal Attainment Program) administered by physical and occupational therapists, that was designed to address specific psychosocial risk factors among WAD I and WAD II patients. They found that patients who participated in the Program, in addition to receiving functional restoration physical therapy, achieved significantly improved return to work rates (75%) when compared with a group who received functional restoration physical therapy alone. In addition, it was determined that the differences were more pronounced for subjects who had the greatest number of psychosocial risk factors. The authors concluded that an intervention that is targeted at reducing psychosocial risk factors can be effective in improving function and facilitating return to work among individuals with WAD I and WAD II injuries who have risk factors for prolonged pain related disability.

N. Reassurance and Patient Communication

There are no randomized controlled trials or systematic reviews that address the use of reassurance in the treatment of WAD. However, it was the consensus of the MAA (2001) working group that the practitioner should reassure the patient with a WAD by acknowledging that the patient is hurt and has symptoms, and advising that:

- Symptoms are a normal reaction to being hurt;
- It is important to focus on improvement in function; and
- Maintaining life activities is an important factor in getting better.

Sterner & Gerdle (2004) in their review article regarding acute and chronic whiplash disorders, proposed that rehabilitation and treatment efforts should encourage patients to adopt an active, positive and realistic attitude and strategies at all stages of recovery after injury. They further recommend that during the acute phase of the WAD, the practitioner should provide information to patients regarding the natural recovery of injury, the prognosis, and the symptoms they can expect to encounter, together with advice on how to mobilize the neck.

In terms of effective communication, the consensus of the Australian Acute Musculoskeletal Pain Guideline Group (2003) was as follows:

- Clinicians should work with patients to develop a management plan so that patients know what to expect, and understand their role and responsibilities;
- Information should be conveyed in correct but neutral terms, avoiding alarming diagnostic labels. Jargon should also be avoided;
- Explanation is important to overcome inappropriate expectations, fears or mistaken beliefs that patients may have about their condition or its management;
- Printed material may be effective for communicating concepts;
- Clinicians should adapt their method of communication to meet the needs and abilities of each patient; and
- Clinicians should check that information that has been provided has been understood. Barriers to understanding should be explored and addressed.

O. Functional Interventions

The use of functional interventions in the treatment of WAD I and WAD II in the acute/sub-acute phase is not well represented in the scientific literature. There is also an absence of literature pertaining to workplace/home/community-based interventions and return to work programs for WAD I and WAD II. In spite of this, stakeholders (e.g. healthcare providers, lawyers and insurers) agreed that this is a critical area and should be included in the Background Paper.

The majority of functional intervention literature and research is specific to work-related disability within a workers' compensation system. This research tends to be focused on patients with lower back injuries and therefore caution must be used in extrapolating the findings to individuals with whiplash type injuries.

The concept of functional restoration grew out of the failure of more conventional treatments and rehabilitation strategies to facilitate recovery and return to pre-accident activities. Functional restoration, as an approach, was first described by Mayer et al. (1985) who proposed that intervention with injured individuals should be focused on function rather than on pain or disability.

Using this type of approach, the treatment plan is designed around an identification of what the injured individual needs to do in order to function in his/her home and work environment; typically referred to as "critical demands". The patient is assessed to determine the level of current functioning relative to his or her critical demands and any functional

limitations that have arisen as a result of the injury. A functional restoration treatment program is designed to address these limitation areas and to help an individual will be able to resume normal activities at home and at work.

Increasingly, the venue of functional restoration programs has shifted from clinical settings to worksite/home-based delivery. This development has occurred in an effort to achieve greater generalization of functional restoration results to naturalistic settings as well as to facilitate integration of the injured party back into the home/work environment. The opportunity to interface with family members, co-workers and the employer is also an important aspect of this approach.

Frank et al. (2000) summarized the research on interventions and approaches aimed at facilitating early and safe return to work. The studies they examined were based primarily on injured workers with soft tissue injuries. Their literature review revealed that, immediately after the injury, education, assurance, encouragement to continue normal activities and constructive workplace involvement (including the potential for modified work) can reduce both the incidence and the duration of soft tissue injury claims. During the sub-acute phase (up to 3 months post injury), the evidence suggests that a more aggressive approach to treatment, with a focus on supervised exercise instruction combined with ergonomic intervention at the worksite, is associated with the prevention of long-term disability and the promotion of timely return to work. Frank et al. also concluded that a successful return to work outcome is influenced by many factors in addition to the individual's injury. Specifically, they stressed the importance of the various stakeholders (e.g. healthcare providers, employers, insurers) communicating and coming to a mutual understanding regarding the elements of a successful return to work program and their respective roles in facilitating the outcome.

While the foregoing findings may not be directly applicable to individuals with an acute/sub-acute WAD I or WAD II injury, there are enough similarities among soft tissue injuries and related systemic factors to suggest that functional, home and worksite based interventions should be further explored in the PAF Guideline.

P. Education

Provision of education materials is a common element of WAD treatment programs and is mandated in the Ontario Pre-Approved Framework Guidelines. Although there are no systematic reviews regarding the use of educational interventions for WAD, the reviewers did identify two recent Canadian clinical trials of educational interventions for whiplash. Both trials were conducted using individuals admitted to emergency departments with acute whiplash injuries.

In Alberta, Ferrari et al. (2005) tested an educational intervention at the University of Alberta Hospital. The intervention group received an educational pamphlet based on current evidence. The control group received only the usual emergency department care and a standard discharge information sheet. The researchers followed up with both groups by telephone interview at two weeks and three months. The primary outcome measure was the patient's response to the question, "How well do you feel you are recovering from your injuries?" A total of 112 subjects agreed to participate. At two weeks post collision, 7.3% in the treatment group reported recovery compared with 8.8% in the control group. At three months post collision, 21.8% in the treatment group reported complete recovery compared with 21.0% in the control group. In addition, at three months, there were no clinically or statistically significant differences between groups in severity of remaining symptoms, limitations in daily activities, therapy use, medications used, lost time from work, or litigation. The authors concluded that an evidence-based educational pamphlet provided to patients at discharge from the emergency department was no more effective than usual care for patients with WAD I or II.

In Kingston, Ontario patients presenting to four tertiary care emergency departments following rear-end collisions were eligible for recruitment to a clinical trial (Brison et al., 2005). Following informed consent, patients were contacted at home and allocated to receive an educational video plus usual care or usual care alone. The video provided reassurance, and advice about posture, return to regular activities, exercises, and pain-relief methods. Data was collected by telephone using standardized questionnaires. The primary outcome was the presence of persistent WAD symptoms (i.e. frequency and severity of neck, shoulder, or upper back pain) at 24 weeks post injury. There were 206 subjects in the intervention group and 199 subjects in the control group. In considering both groups together, the proportion of subjects with persistent WAD symptoms decreased from 89.1% at baseline to 33.6% at 24 weeks after injury and remained above 30% at one year from the collision. At 24 weeks, the proportion of subjects with persistent WAD symptoms in the intervention group, (29.9%), was 7.9% lower than the control group. There was thus some evidence that the provision of an educational video was associated with a lower prevalence of symptoms, but the association did not achieve statistical significance.

A Cochrane review undertaken by Haines et al. (2006) also noted one controlled trial (Borchgrevinck, 1998) that found neck school for acute, sub-acute and chronic mechanical neck disorder to have no short-term effect on relieving pain.

There are no published trials related to the efficacy of educational materials distributed by treatment providers in the community.

VI. Conclusions

In this Background Paper, a narrative summary of the scientific literature pertaining to acute and sub-acute WAD I and II has been presented. Specifically, this summary includes:

- Systematic reviews of the literature such as those undertaken by the Cochrane Collaboration;
- Studies related to prognostic and risk factors shown to impact recovery from injury;
- Conservative management of WADs, mechanical neck disorders, neck disorders with radiculopathy, neck disorders with headache, and neck pain;
- The acute and sub-acute phases of WAD to about three months after injury; and
- Other high quality studies that were deemed worthy of consideration that had been published more recently than the systematic reviews.

The literature review revealed that relatively few interventions for the treatment of acute and sub-acute WAD I and WAD II have been shown to be effective in well-designed research trials. The Background Paper literature review does support a course of treatment that involves the following interventions:

- Reassurance;
- Activation (normal daily activities);
- Mobilization/manipulation when combined with exercise;
- Education on self-management of acute WAD; and
- Exercise including active range of motion, stretches and a home exercise regime (stretching and isometric strengthening).

The literature review revealed some limited evidence for:

- Intravenous injection of methylprednisolone for acute whiplash;
- Pulsed electromagnetic field therapy (PEMF); and
- Low Level Laser Therapy.

The literature review indicated that harmful effects are associated with the following interventions:

- Advice to rest; and
- Continuous use of soft collar during the acute or sub-acute phase of WAD

Finally, the literature review indicated that there are many interventions for which there is no evidence or the evidence remains controversial.

With respect to areas for potential improvement to the existing WAD I and WAD II PAFs, the literature reviewed in this Background Paper suggests that greater consideration should potentially be given to identifying those

individuals with higher levels of initial pain, distress and disability especially given that these elements may impact the recovery process and the duration of disability. In addition, the literature directionally supports the importance of functionally-based approaches to rehabilitation of all soft tissue injuries.

Appendix A – Existing Clinical Practice Guidelines

Clinical Practice Guidelines are “systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances” (Field and Lohr, 1990, p.8). Evidence-based guidelines for the management of WAD and neck pain have been prepared by reviewers and committees in other jurisdictions. Seven of these existing guidelines are presented below.

1. Philadelphia Panel Guideline: Evidence-based clinical practice guidelines on selected rehabilitation interventions for neck pain (2001).

The Philadelphia panel employed a structured and rigorous methodology in assessing the scientific literature and developing an evidence-based clinical practice guideline for selected rehabilitation interventions used in the management of neck pain. The panel also incorporated into their process an opportunity for 324 practitioners to provide feedback on the recommendations through the use of a survey questionnaire. The Philadelphia Panel reviewed the comments received and incorporated them into the evidence-based clinical practice guideline. The selected interventions included Mechanical Traction, Transcutaneous Electrical Nerve Stimulation (TENS), EMG biofeedback, thermotherapy, massage, electrical stimulation and therapeutic exercises. The conclusion of the Philadelphia Panel was that there was a lack of evidence regarding whether to include or exclude the use of thermotherapy, therapeutic massage, EMG biofeedback, mechanical traction, therapeutic ultrasound, TENS, electrical stimulation, and combined rehabilitation interventions in the daily practice of physical rehabilitation of patients with acute neck pain.

2. Best-evidence clinical practice guideline for the delivery of physiotherapy services to patients with whiplash-associated disorders (Scholten-Peeters et al. 2002).

According to the authors of the guideline, the primary goal of therapy is a quick return to normal daily activities and the prevention of chronicity. Therefore, active interventions are recommended. Further, in the case of whiplash patients with delayed recovery, the main goals are to influence factors that are contributing to poor progress and to improve active coping strategies.

The authors organized the clinical guideline into four phases reflecting the elapsed time since the accident. They then established physiotherapy treatment goals for each of these phases, as described below:

- **Phase 1 - less than 4 days post accident**

The treatment goals in Phase I are to:

- Reduce pain;
- Provide information;
- Explain the consequences of whiplash; and
- To reach these treatment goals, education and frequently repeated active cervical movements within the comfortable range are recommended. Advice to rest or to wear a soft collar is not recommended. In consultation with the physician, NSAIDs may be advised for patients with a high intensity of pain.

- **Phase 2 - 4 to 21 days post accident**

The treatment goals in Phase II are to:

- Provide information;
- Explain the consequences of whiplash;
- Improve function (e.g. muscular stability, range of motion); and
- Increase activity (e.g. reaching, pushing, walking).

According to the authors, treatment during this phase should be focused on increasing function and return to ordinary activities as soon as possible. To attain these goals, it is important to inform and reassure the patient about the benign nature of the symptoms and to explain the risk that chronic pain may develop. Furthermore, graded activation may prevent fear of movement. Interventions such as education, exercise therapy, and functional activities are advised.

- **Phase 3 - 3 to 6 weeks post accident**

In the case of normal recovery, the treatment goals in Phase III are to:

- Provide information;
- Explain the consequences of whiplash;
- Improve function (e.g. muscular stability, muscle strength, body posture, concentration, attention);
- Increase activity (e.g. work, housekeeping, or recreation); and
- Increase participation (e.g. work, housekeeping, and social activities).

To reach these treatment goals, the treatment during this phase should be focused on improving activities rather than on pain reduction. Negative beliefs and/or passive coping strategies need to be corrected. It is important for physiotherapists not to overemphasize the physical aspects and ignore the psychosocial factors. To reach these treatment goals, interventions such as training in functional activities are recommended.

In the case of delayed recovery, the treatment goals in Phase III are to:

- Improve active coping strategies; and

- Improve self-efficacy.

To reach these treatment goals, interventions such as education, exercise therapy based on behavioural principles, and training of functions and activities are recommended. Especially in patients with delayed recovery, it is important to stimulate effective coping strategies, increase feelings of self-control, and decrease distorted thinking about pain (e.g. catastrophizing, fear of movement). To prevent or influence fear of movement, it is recommended that activities be built up gradually to construct positive movement experiences, especially for activities the patient tends to fear or avoid.

- ***Phase 4 - 6 weeks or greater post accident***

In the case of normal recovery, the main treatment goals for Phase IV are to:

- Provide information;
- Explain the consequences of whiplash; and
- Improve the level of activities and participation.

To reach these treatment goals, the treatment in this phase should be focused on increasing activities and participation in case of a normal recovery.

In the case of delayed recovery, the main treatment goals are:

- Improve active coping strategies; and
- Acquire self-control over symptoms and exacerbations.

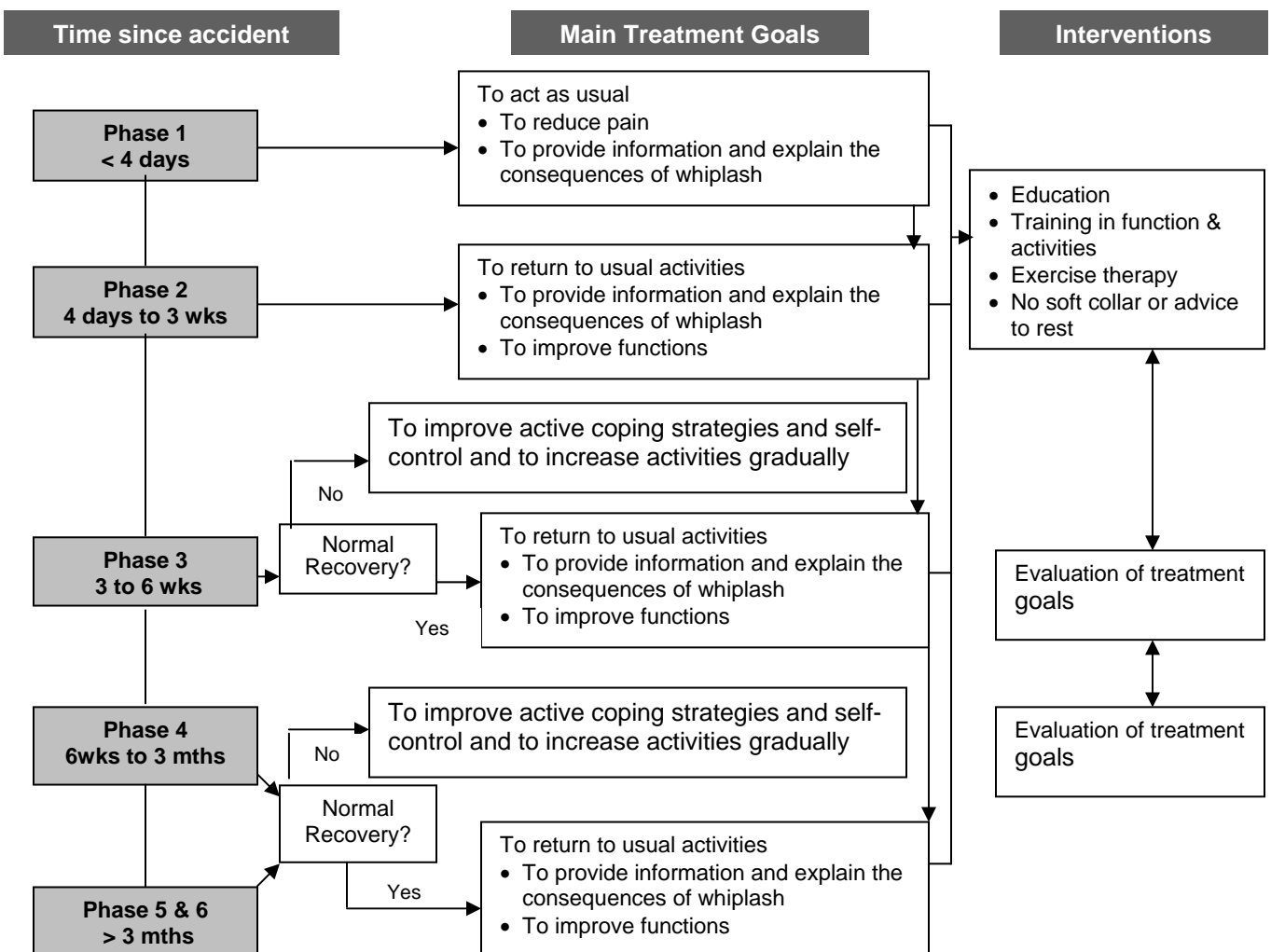
In order to reach these treatment goals, the treatment in this phase should be focused on influencing the way patients cope with their problems. These patients need to be actively involved in the treatment process and dissuaded from assuming a passive role and waiting to be cured by the physiotherapist. The recommended interventions are education, training in functional activities and exercise therapy based on behavioural principles.

For patients with long-lasting participation problems, disabilities, or impairments, the authors recommend a therapeutic approach consisting of increasing activities and participation based on behavioural principles. Treatment focuses on increasing health behavior with graded activation, promoting feelings of self-control, and thinking positively about pain. They suggest that the referring physician may be consulted about a specialized psychological referral for patients with major psychological problems such as depression or anxiety, or for those who fail to respond to treatment. A multidisciplinary team approach can also be considered for these patients.

In the guideline, Scholten-Peeters et al. further recommended evaluation of the treatment goals and responses to treatment during the treatment process and after the treatment period, using adequate, reliable, and valid measurements that cover the same domains as the treatment goals (e.g., Neck Disability Index for impairments and disabilities, Visual Analogue Scale of pain for impairments, Coping Strategies Questionnaire for coping and self-control). They also indicated that treatment should be terminated if the health problem is resolved or if the treatment goals are reached. Finally, treatment should be terminated, and the referring physician contacted, if no more positive treatment effects can be expected.

The therapeutic process recommended by Scholten-Peeters et al. for the treatment of whiplash patients is represented in Figure 1 below:

Figure 1 – Scholten-Peeters et al. Summary of Therapeutic Process for Whiplash Patients



3. Evidence-based clinical practice guideline for manipulation or mobilization in treating mechanical neck disorders with or without radicular findings or cervicogenic headache (Gross et al., 2002).

As described in the main body of this Background Paper, Gross et al. undertook a systematic review of the literature pertaining to manipulation and mobilization for mechanical neck disorders (through to March 2002). In developing a related practice guideline, they recommended a multi-modal management strategy using mobilization or manipulation plus exercise for relief of mechanical neck pain. Of the beneficial multimodal strategies, the common element is exercise plus mobilization or exercise plus manipulation. The effect of other combinations of multimodal treatment is less clear. The weight of the evidence suggests that there is less likely to be a benefit when either manipulation alone, mobilization alone or a combination of the two are used, than when these manual therapies are used in combination with exercise. The benefit of other therapies (e.g. drugs, relaxation, massage) or modalities (e.g. thermal agents, electrotherapies, phototherapies, orthoses) used in conjunction with manual therapy are unclear.

4. Motor Accidents Authority of New South Wales Whiplash Guideline (2001)

A panel appointed by the New South Wales Motor Accidents Authority published guidelines for WAD I, II and III in 2001. The MAA Guidelines were designed to update the Quebec Task Force Guidelines and to specifically address the assessment and treatment of WAD I, II and III in the first 12 weeks following the motor vehicle accident.

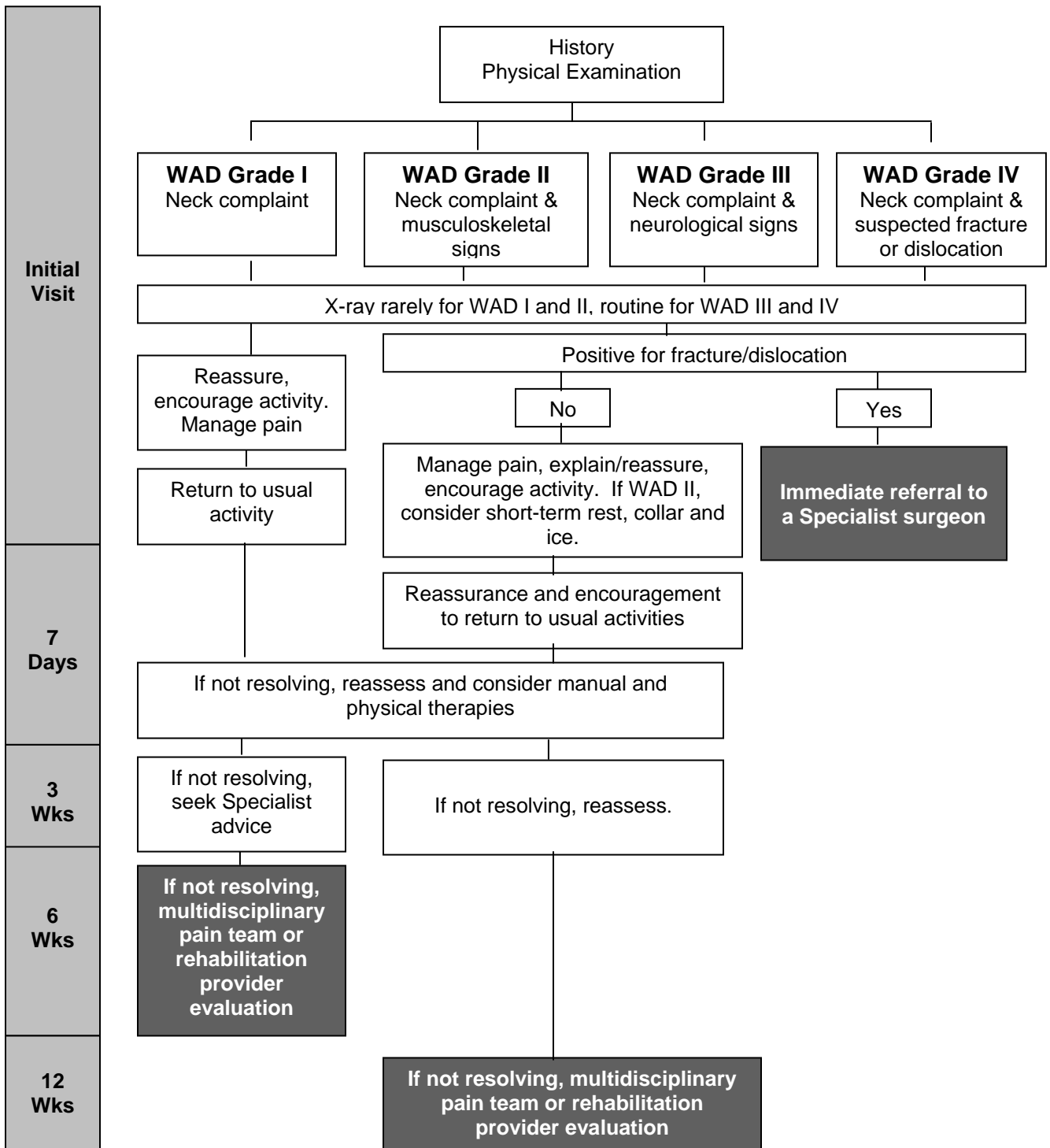
These authors proposed that a General Practitioner would undertake the initial evaluation and would direct care. They suggested that, in general, a referral for physical therapy or manual therapy is not required for the first few days, but if required, should commence within seven days of the injury. In addition, they introduced the concept of “whole person treatment,” which includes managing any accompanying anxiety and/or depression that may be associated with WAD or with other stressful life events.

Many of the MAA recommendations for assessment and treatment of WAD are already reflected in the foregoing sections of this report. With respect to treatment, the MAA sorted the various intervention approaches into three categories based upon the degree to which the interventions were shown to be effective in the scientific literature and under what circumstances. The resulting classification is summarized in Table 4. The MAA also depicted its recommendations on a timeline, which is illustrated below in Figure 3.

Table 4 – Motor Accidents Authority of New South Wales - Interventions for WAD

RECOMMENDED	RECOMMENDED UNDER CERTAIN CIRCUMSTANCES	NOT RECOMMENDED	NOT RELEVANT
<ul style="list-style-type: none"> - Reassurance - Recommendation to act as usual - Prescribed function - Work alteration - Relaxation techniques - Exercise - Simple analgesics in the case of WAD I - Non Opioid analgesic in the case of WAD II and III 	<ul style="list-style-type: none"> - Postural advice - Mobilization - Manipulation - Traction - Multimodal treatment - Acupuncture - Passive modalities and electrotherapies - Prescribed rest for not more than four days in the case of WAD II and WAD III - Collars for not more than 72 hours in the case of WAD II and WAD III 	<ul style="list-style-type: none"> - Cervical pillows - Prescribed rest in the case of WAD I - Collars in the case of WAD I - Steroid injections - Magnetic necklaces - Pilates - Feldenkrais - Alexander Technique - Massage - Homeopathy 	<ul style="list-style-type: none"> - Sterile water injections - Local anesthetic nerve blocks

Figure 3 – MAA Guidelines for Early Management of WAD



5. Australian Acute Musculoskeletal Pain Guidelines for Acute Neck Pain (2003)

These Guidelines were the result of a large scale multidisciplinary review of the scientific evidence for the diagnosis, prognosis and treatment of acute musculoskeletal pain. The aim was to integrate the best available evidence with clinical expertise and the values and beliefs of patients. The project was coordinated by the University of Queensland Faculty of Health Sciences and was funded by the Commonwealth Department of Health and Ageing. The review of the scientific evidence was undertaken in accordance with the National Health and Medical Research Council standards and the strategies proposed by Cochrane Collaboration. The stated objective of this extensive project was to “promote informed and effective management of such pain, empower consumers and advance understanding of acute musculoskeletal pain through identification of research needs”.

The Australian Guidelines covered several different musculoskeletal pain conditions including:

- Acute Low Back Pain;
- Acute Thoracic Spinal Pain;
- Acute Neck Pain (idiopathic and WAD);
- Acute Shoulder Pain; and
- Anterior Knee Pain.

The themes that emerged from the review included the following:

- An episode of acute musculoskeletal pain is of short duration (less than three months). Recurrent episodes of acute musculoskeletal pain may occur, and a few people will develop chronic pain. Early identification of people at risk of chronic pain facilitates early intervention;
- Clinical assessment comprising a history and physical examination is important to identify features of rare but serious causes of acute musculoskeletal pain. In the majority of the remaining cases, it is not possible to determine the cause of acute musculoskeletal pain and a specific diagnosis is not required for effective management;
- Ancillary investigations are generally not indicated for acute musculoskeletal pain;
- Simple interventions (e.g. providing information, assurance and encouraging reasonable maintenance of activity) may be all that are required for the successful management of acute musculoskeletal pain. These interventions can be used in combination with other non-pharmacological and pharmacological treatments;
- People with acute musculoskeletal pain should be reviewed to evaluate progress and to check for serious condition (e.g. red flags) and psychosocial and occupational factors (e.g. yellow flags);

- Management of acute musculoskeletal pain involves a partnership approach; a management plan should be developed by the clinician and the patient and tailored to suit individual needs.

The findings of the Australian Acute Musculoskeletal Pain Group review are presented in terms of “Key Messages” related to diagnosis, prognosis and interventions. Many of the key messages related to the management of acute musculoskeletal neck pain have already been referenced in this document. The Australian Acute Musculoskeletal Pain Guidelines Group also sorted the various interventions used in the treatment of acute musculoskeletal pain into three categories based upon the existence of scientific evidence to support their benefit. These categories of treatment are summarized in Table 5.

Table 5 – Australian Acute Musculoskeletal Pain Guidelines - Interventions for acute Musculoskeletal Neck Pain

EVIDENCE OF BENEFIT	INSUFFICIENT EVIDENCE	EVIDENCE OF NO BENEFIT
<ul style="list-style-type: none"> • Advice to stay active • Exercise • Multi-Modal Therapy • PEMT 	<ul style="list-style-type: none"> • Acupuncture • Analgesics – Opioid • Analgesics – Simple • Cervical manipulation • Cervical passive mobilization • Electrotherapy • Gymnastics • Microbreaks • Multidisciplinary Biopsychosocial Rehabilitation • Muscle relaxants • Neck school • NSAIDs • Patient education • Spray and Stretch • Traction • TENS 	<ul style="list-style-type: none"> • Collars

6. Swedish Whiplash Commission (2005)

The Swedish Whiplash Commission was appointed in the summer of 2002. Their three-year initiative was funded by the four largest insurance companies in Sweden and had a mandate to explore the problems of whiplash-related road accident injuries from road safety, medical and insurance perspectives. The Final Report and recommendations of the Swedish Whiplash Commission were based upon extensive examination of scientific literature as well as discussion with interest groups, experts and the public.

A related initiative that arose out of the Swedish Whiplash Commission was the development of a task force of the Swedish Society of Medicine that was asked to formulate a practical consensus document for the diagnosis and early management of acute WAD. The overriding principle represented in the resulting recommendations was “right diagnosis and early treatment”. While the task force guideline itself was not made available as part of the Whiplash Commission Report, the contents of the guideline were described and are summarized below:

- **Diagnostic Procedures:**

- Symptoms and clinical findings related to whiplash impact should appear within a few days after the trauma;
- Meeting with the patient is very important as part of a “patient-centered” methodology;
- The practitioner must listen actively to the patient’s fears and expectations;
- The practitioner must form a complete picture of the patient’s state of health and life situation;
- A description of the accident is important and initiates the diagnosis;
- The extent of pain, stiffness, numbness or other neurological symptom must be considered;
- Signs of stress, anxiety and insomnia are noted;
- The patient should be asked to provide a self-assessment of his/her level of pain as severe pain intensity at the early stages is a prognostic factor for later chronicity;
- Previous neck problems should be clarified;
- Current work status should be clarified; and
- The grade of WAD should then be estimated using a simplified version of the QTF classification system (i.e. WAD I – III only).

- **Treatment:**

- Generally, the amount of treatment required increases with the WAD grade;
- In the case of WAD I or II patients with mild level of self-assessed pain intensity (1 - 4 on a 10 point visual analogue scale), the patients should be told that their prognosis for recovery is good and that they should not modify their involvement in normal activities (e.g. recreation and work);
- In the case of WAD II or III patients with moderate self-assessed pain intensity (5 – 6 on a 10 point visual analogue scale), the patients should be told that recovery may take some weeks. A few days of sick leave may be considered. Patients should be encouraged to engage in head-turning (neck mobilization) and other gentle self-activation. Ordinary pain tablets may be prescribed for a week or so. If no improvement is noted in the first week, the patient should contact his/her own doctor for follow-up;
- In the case of WAD II patients with severe self-assessed pain intensity (7 – 10 on a 10 point visual analogue scale), there is a greater risk of prolonged symptoms and recovery may take longer. Information should be provided to the patient to avoid negative expectation and anxiety, and stronger pain relief medication may be required. Short-term sick leave may be considered;

- In the case of WAD III patients, the foregoing also applies but a return appointment should be booked within one week. Sick leave from work may be recommended as well as telephone contact after a few days;
- In the case of WAD patients who do not improve and are showing continued symptoms, further examination may be required to rule out neurological involvement; and
- In the case of WAD patients who do not improve and are showing continued symptoms, referral to a physiotherapist may be required. Mobility and fitness training, relaxation exercise and self-activation are effective in the early stages. Passivity and rest are not as effective. Mobilization and manipulation are not recommended. Cervical collars are not recommended.

7. Prodigy Guidance for Acute Neck Pain (<http://www.prodigy.nhs.uk>)

The Prodigy Guidance is a web-based set of guidelines designed to offer support to healthcare professionals working within England's National Health Service. The development and maintenance of Prodigy is funded by the Department of Health. This service provides an up-to-date source of clinical knowledge to assist healthcare professionals and patients, in managing the common conditions generally seen in primary and first-contact care. This knowledge is available in a variety of formats including full guidance, quick reference guides, and patient information leaflets that cover acute and chronic illnesses, and disease prevention. Approximately 200 health topics are covered, including many of the conditions that can be managed by non-physicians.

Prodigy provides information related to:

- Treatment options for specific clinical situations;
- Whether, when, and how to assess a patient;
- When to refer a patient to a specialist; and
- Drugs or devices to prescribe.

The Prodigy guidelines for the management of acute neck pain include simple, non-specific neck pain and pain following whiplash. The associated recommendations for assessment and treatment are summarized below:

- **Assessment**
 - Assess for 'red flags' and the potential existence of serious pathology;
 - If there has been a recent whiplash incident, exclude a fracture or dislocation of cervical vertebra;
 - Assess and document severity of neck pain and any disability due to neck pain;
 - Consider using a standardized scale for neck pain and disability due to neck pain;
 - Identify and manage risk factors for developing neck pain such as awkward neck postures, neck flexion, arm force, arm posture, duration of sitting,

twisting or bending of the trunk, hand-arm vibration, and some workplace designs; and

- Identify and address psychosocial factors that may indicate increased risk for chronicity and disability such as excessive concerns about the neck pain, unrealistic expectations of treatment, disabling sickness behaviour, and problems with compensation, work, family, moods and emotions (i.e. Yellow Flags).

- **Treatment**

Reassurance and Patient Information:

- Acute, simple neck pain may require mild analgesia, and usually takes a few days to recover;
- Early mobilization and return to a normal, active lifestyle will improve outcomes;
- Poor posture should be corrected if it is thought to precipitate or aggravate the neck pain;
- Driving may be inadvisable if the range of motion of the neck is restricted;
- A firm pillow may provide comfort at night; and
- Neck supports, if used, should be used for as short a time as possible (i.e. 2-4 days maximum) and under supervision, to ensure that mobilization is commenced as soon as possible.

Drug Therapy:

- Analgesics can be used to provide short-term pain relief. Prescribe according to the level of pain, personal preferences, and the presence of any cautions or contraindications.

Physical and Manual Treatment:

- Consider referral to a physiotherapist, chiropractor or osteopath for physical or manual treatment;
- Physiotherapy may assist in achieving early mobilization and return to usual activities; and
- Active physiotherapy, mobilization, manipulation, and exercise may provide short-term relief in people with chronic neck pain.

Appendix B –Interviews with Other Jurisdictions

In an effort to gain a greater understanding of some of the issues associated with the implementation of clinical guidelines, a decision was made to interview representatives from other organizations that had related experiences similar to Ontario. Members of the PAF Project Advisory Committee and the PAF Technical Working Committee were asked to review a preliminary list of organizations and were invited to submit additional organizations for potential inclusion in the interviews.

The final list of the organizations that were contacted, included:

- Alberta Workers' Compensation Board;
- New Jersey Department of Banking and Insurance;
- Ontario Workplace Safety and Insurance Board;
- Peace Hills General Insurance Company (Alberta);
- Saskatchewan General Insurance;
- Société de L'assurance Automobile du Québec;
- The Victorian WorkCover Authority (Workers Compensation) Victoria, Australia.

It is noteworthy that the interviews with other jurisdictions, while guided by some general questions, were undertaken using a conversational approach. As mentioned above, the related findings should not be considered scientific or evidence based. Rather, this information is intended to provide insight into how clinical guidelines have been implemented in other parts of Canada and the world in order to inform the PAF Project in Ontario.

The interviews were conducted over the telephone and each was approximately one hour in length. Although some findings were unique to specific jurisdictions, the feedback from the various organizations was remarkably consistent. This feedback is summarized below and organized by the questions posed to the interviewees.

- What was your general experience in with the development and implementation of care models/treatment guidelines?
 - Overall this is a worthwhile and positive experience in spite of some of the challenges encountered.
 - Lots of work but worth the effort.
 - In general, things went well with the introduction of care models/treatment guidelines.
- What types of care models/treatment guidelines does your organization use? (i.e. injury categories or diagnoses covered).
 - Whiplash Associated Disorders.

- Soft Tissue Injuries.
- Sprains and Strains.
- Diagnosis specific clinical practice guidelines.
- Do you plan to develop and introduce additional care models/treatment guidelines?
 - Yes.
 - Acquired Brain Injury.
 - Chronic Pain.
 - Psychological Injuries/conditions (e.g. PTSD).
- How were these care models/treatment guidelines developed and implemented?
 - Employed a project management approach.
 - Consulted with stakeholders (e.g. professional healthcare associations, insurers, consumers).
 - Established a stakeholder reference/advisory group.
 - Consulted with technical experts.
 - Reviewed and summarized scientific evidence.
 - Retained external consultants to assist in the development of the care model/guideline/protocol and to build consensus.
 - Undertook stakeholder consultations.
 - Based care models/treatment guidelines on scientific evidence.
 - Used consensus approach where the evidence was lacking.
 - Piloted the care models/treatment guidelines prior to full implementation.
 - Trained providers and insurance adjusters.
- How are these care models/treatment guidelines managed?
 - Overseen and managed by Province/State/Non-Governmental Organization.
 - Managed internally by a dedicated department of the organization as opposed to outsourced to a third party administrator.
 - Developed contracts with providers/provider groups.
 - Organized providers into a network or a delivery system.
 - Requirement for regular and standardized reporting by providers.
- Is the performance of provider and the overall system evaluated?
 - Yes.
 - Formalization of relationships with individual providers or provider group using memorandum or agreement or contract.
 - Identification of Performance Domains (e.g. Efficiency, Effectiveness and Satisfaction).
 - Identification of Key Performance Indicators (KPIs) and targets.
 - Reflection of KPIs and targets in provider contracts/agreements.
 - Collection and analysis of performance data.
 - Use of provider reports to collect performance data.

- Comparison of performance with targets.
 - Production of regular scorecards/report cards for providers.
 - Clinical file review for qualitative elements.
- Are there fee schedules associated with the care models/ treatment guidelines?
 - Yes.
 - Block fees.
 - Fee for service to a maximum number of visits and total maximum expenditure.
- How are the fees determined?
 - Negotiation with providers and provider associations.
 - Researched fee schedules used in other jurisdictions.
 - Market testing of fees
- Do you have any financial incentives/disincentives tied to performance?
 - Yes – incentive payments for sustained return to work outcomes.
 - Yes – incentive bonus for outcomes and reduced length of stay in clinic.
 - Yes – 50% co-pay penalty for treatment outside the guideline.
- What challenges, if any, have you encountered in the development, implementation and ongoing management of the care models/treatment guidelines?
 - Individuals trying to circumvent the system.
 - Managing the “bad players”.
 - Getting stakeholders to reach a consensus.
 - Resistance from professional healthcare associations.
 - Lack of involvement on the part of insurers.
 - Insurers assuming that this was exclusively a “provider issue”.
 - Adversarial approach to soft tissue injury management.
 - Lack of understanding of and expertise in worksite reintegration issues on the part of providers.
- What advice would you have for other regulators or insurance organizations who are establishing care models/treatment guidelines?
 - Don’t “tinker”. Ensure that there is a comprehensive, well-designed system in which to introduce care models/treatment guidelines.
 - “Stick to your guns”. Managers of the system must be vigilant.
 - The comprehensive system design is very important. It must be both comprehensive and manageable.
 - Make sure that you get the stakeholders “on-side”. Stakeholder buy-in is critical.
 - Invest in related education and training of all stakeholders at the outset and on an ongoing basis.
 - Make sure that there are resources and an infrastructure dedicated to ongoing management of the system in which the care models/treatment guidelines are being introduced. It is not enough to introduce the care

- models/treatment guidelines. They must also be managed.
- Ensure that the regulator or insurance organization has sufficient resources for implementation and ongoing management and for troubleshooting related processes.
 - Get involved and/or fund related research projects.
 - Insurers and regulators need to show leadership.
 - Make sure that there is an overarching evaluation framework that specifies expectations of the care models/treatment guidelines and the various stakeholders.
 - Hold the various stakeholders in the system accountable to the expectations established and consider the consequence of non-compliance.
 - Determine up front what the expected outcomes are and report regularly on performance relative to these expected outcomes.
 - Keep the evaluation system relatively simple. Focus on a few key indicators/outcomes.
 - Focus on functional outcomes.

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