Clinical Practice Guideline for the Physiotherapy of Patients With Whiplash-Associated Disorders

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Study Design. A clinical practice guideline.

Objectives. To assist physiotherapists in decision making and to improve the efficacy and uniformity of care for patients with whiplash-associated disorders Grades I and II.

Summary of Background Data. Whiplash constitutes a considerable problem in health care. Many interventions are used in physiotherapy practice, despite increasing evidence for the use of active interventions. There is still no clinical practice guideline for the management of patients with whiplash-associated disorders.

Method of Development. A computerized literature search of Medline, Cinahl, Cochrane Controlled Trial Register, Cochrane Database of Systematic Reviews, and the Database of the Dutch National Institute of Allied Health Professions was performed to search for information about the diagnostic process and the therapeutic process in whiplash patients. When no evidence was available, consensus between experts was achieved to develop the guideline. Practicing physiotherapists reviewed the clinical applicability and feasibility of the guideline, and their comments were used to improve it.

Recommendations. The diagnostic process consists of systematic history taking and a physical examination supported by reliable and valid assessment tools to document symptoms and functional disabilities. The primary goals of treatment are a quick return to normal activities and the prevention of chronicity. Active interventions such as education, exercise therapy, training of functions, and activities are recommended according to the length of time since the accident and the rate of recovery. The biopsychosocial model is used to address the consequences of whiplash trauma.

Conclusions. Scientific evidence for the diagnosis and physiotherapeutic management of whiplash is sparse; therefore, consensus is used in different parts of the guideline. The guideline reflects the current state of knowledge of the effective and appropriate physiotherapy in whiplash patients. More and better research is necessary to validate this guideline in the future. (Key words: consensus, diagnostic process, evidence, guideline, physiotherapy, therapeutic process, whiplash) Spine 2002;27:412–422

Whiplash poses a considerable problem in health care. The long-lasting symptoms and disability in many patients have important economic consequences. The total costs related to whiplash are about $29 billion a year in the United States. A clinical practice guideline for the physiotherapy management of whiplash patients is not yet available.

The purpose of this article is to describe a “best evidence” guideline for whiplash patients, which was recently developed in The Netherlands. A few principles underlying the guideline are explained: the definition of whiplash, the biopsychosocial model, the natural course of whiplash, and potential prognostic factors that may influence the rate of recovery in whiplash patients.

Definition of Whiplash and Scope of the Guideline

This guideline uses the most current and accepted definition of whiplash taken from the Quebec Task Force on Whiplash-Associated Disorders (WAD): “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 WAD.” Neck pain, headache, and decreased mobility of the cervical spine are the most common symptoms. These disorders can be classified into five grades of severity (Table 1). This guideline focuses on patients with WAD Grades I and II. In most of these patients, lesions in the cervical spine are the most common symptoms. This guideline focuses on patients with WAD Grades I and II. In most of these patients, lesions in the cervical spine are the most common symptoms.

Biopsychosocial Model

One principle in the development of this guideline is that a whiplash trauma may involve minor soft tissue damage that may lead to impairments in physical and mental functioning, disabilities, and participation problems in work or housekeeping. The authors use the biopsychosocial-
social model to address the consequences of whiplash trauma. In this model, the patient is seen as a system integrating biologic, psychologic, and social dimensions. The model takes into account prognostic factors that may influence recovery and emphasizes the role of psychologic and social factors in the development and persistence of symptoms and disabilities.

### Natural Course and Prognosis

There is still no agreement in the literature about the natural course of WAD after trauma. The estimated proportion of patients who report pain and disability 6 months after the accident varies between 19% and 60%. The estimated proportion of patients who are still absent from work after 6 months varies between 9% and 26%. Chronic WAD is usually defined as symptoms or disabilities persisting for more than 6 months.

Because of the lack of scientific data about the natural course of whiplash, the guideline committee decided by consensus to start with a theoretical construct that distinguishes between patients with normal recovery and those with delayed recovery. Because impairments related to whiplash share the same presumed causes as neck pain and low back pain that are experienced at work, recreation, and other daily life activities, the authors assumed that the relations between functions, activities, and participation are time dependent and comparable with those of these pain conditions. Therefore, in patients with normal recovery, a gradual improvement in physical or mental functions, an increasing level of activity, and an increasing level of participation in work or housekeeping after injury is expected. Patients with delayed recovery experience no improvement or only small improvements in physical or mental functions, activities, and participation, or pain does not decrease. In the latter patients, some psychosocial factors may be present and delay recovery, as in other pain conditions. The authors extrapolated this theoretical construct from patients with low back pain.

### Prognostic Factors

To distinguish between patients who are expected to experience either a normal recovery or a delayed recovery, the authors tried to identify prognostic factors that are related to persistent symptoms. Based on a literature search, only those prognostic factors that are reported in two or more studies and that are related to prolonged symptoms in whiplash patients were included in the guideline (Table 2). The factors mentioned in Table 2 can be measured easily and may have an influence on the risk of delayed recovery during primary care. However, physiotherapists or physicians cannot influence these factors. Recent systematic reviews have shown the importance of psychosocial factors in the prognosis of other pain conditions, such as low back pain. These factors include, for example, the patient’s belief that he or she has a serious disease, the expectation that the condition is likely to worsen, fear avoidance behavior, inadequate cognition, catastrophizing, maladaptive coping strategies, depression, and anxiety (Table 2). These factors may also be of importance in whiplash patients because, as in low back pain, there is often no obvious tissue damage that explains long-lasting symptoms. Therefore, by consensus, the authors decided to include information concerning these prognostic factors in the guideline for the management of whiplash patients.

### Method of Guideline Development

#### Development Process

The guideline was developed according to the method used for physiotherapy guidelines issued by the Dutch Royal Physical Therapy Association, which are based on international methods of guideline development. The method consists of four different phases: (1) the preparation, (2) the design of the guideline, (3) the implementation, and (4) the update phase. This article focuses on Phase 1 and Phase 2. The guideline was constructed according to the different phases of the physiotherapy assessment: referral, history taking, physical examination, analysis, formulation of treatment plan, treatment, and evaluation of treatment. The whiplash guideline was drafted by seven experts. They used...
the best evidence from systematic reviews, randomized clinical/controlled trials (RCTs) and prospective studies.55 When evidence was not available, the recommendations of the guideline were formulated on the basis of consensus among group members. The authors defined grades of recommendation according to Sackett et al (Table 3).55

Parallel to the expert group, a multiprofessional group was formed of seven clinicians from various specialties involved in providing care in this field (general practitioner, psychologist, orthopedic surgeon, neurologist, otoneurologic physician, medical advisor) and a patient representative of the Dutch Whiplash Association. This group assessed the quality of the guideline and its applicability to everyday clinical care. Furthermore, the content, formulation, and style of the guideline, its specificity, and its applicability to clinical practice were reviewed by 32 randomly selected practicing physiotherapists who were not involved in the development of the guideline. Their comments were used to improve the guideline. The final guideline was authorized and approved by the Dutch Royal Physical Therapy Association and the Dutch Society of General Practitioners. Every 5 years this guideline will be updated and revised if necessary.

**Literature Search**

A comprehensive computer-aided search of Medline (1966 through June 2000), Cinahl (1982 through June 2000), Cochrane Controlled Trial Register (Issue 3 2000), Cochrane Database of Systematic Reviews (Issue 3 2000), and the database of the Dutch Institute of Allied Health Professions (1987 through June 2000) was performed. References of relevant articles were also screened. Articles concerning the diagnostic process and the therapeutic process in physiotherapy were searched for. Two independent reviewers (GEB, GGMS) conducted the searches. The key words and free text words used to identify the study population were whiplash, neck sprain, and neck injury. To identify the diagnostic tests, they were measurement and assessment; to identify outcome measures, they were range of motion, coordination, balance, stability, pain, disability, functional state/status, and quality of life; and to identify the methodologic quality of diagnostic tests and outcome measures, they were reliability, validity, and responsiveness. The key words and free text words used to identify the interventions were physiotherapy, physical therapy, behavioral therapy, education, massage, mobilization, exercises, and electrotherapy. To identify the design, they were systematic review, meta-analysis, randomized clinical trial, and randomized controlled trial.

Articles were considered relevant and selected if (1) the study population included only whiplash patients; (2) outcome measures were related to functions, activities, or participation; (3) outcome measures were within the scope of current physiotherapy practice; (4) the treatment consisted of physiotherapy interventions; and (5) the language of publication was English, French, German, or Dutch.

### Evidence Supporting the Guideline

**Selection of Studies**

In all, 21 articles were used for the guideline: 7 concerning the diagnostic process, and 14 concerning interventions.5,9,12,16,17,25,35,37,38,44,45,47,54,56

**Treatment Strategies for Patients With Acute Whiplash-Associated Disorders**

Recently, Peeters et al44 assessed in a systematic review the efficacy of conservative treatment in whiplash patients. Eleven RCTs met the inclusion criteria, of which three studies were considered to be of acceptable validity.4,12,47

The RCTs of acceptable validity evaluated the effects of pulsed electromagnetic therapy,12 multimodal treatment, and advice to act as usual4 in patients with acute WAD. The conclusion of this systematic review was that rest may not be advised and that active interventions have a tendency to be more effective in whiplash patients.

Magee et al55 also performed a systematic review of the effectiveness of physical therapy interventions on soft tissue neck injuries. They considered all articles to be of moderate methodologic quality.12,16,37,38,43,47,51,59 A modest trend was reported for the positive effects of exercises, manual therapy, and educational advice on posture in whiplash patients. This review also showed evidence for the ineffectiveness of rest and the use of a soft collar.

The Quebec Task Force drew similar conclusions.56

The Task Force found weak evidence to limit immobilization and weak evidence to support manual mobilizations combined with other physiotherapeutic interventions. Furthermore, the Task Force suggested that mobilizations, exercises, and advice on posture could be used as an adjunct to strategies that promoted increased activity.56

A recently published RCT, not yet included in the systematic reviews, seems to confirm the finding that
early return to usual activities should be encouraged and is preferable to rest and wearing a soft collar. In conclusion, there seems to be evidence for a positive effect of active interventions, including exercise therapy, education, training functions, and activities in acute whiplash patients. On the basis of these results, this guideline promotes early active management and stimulates patients to return to daily activities as soon as possible.

Treatment Strategies for Patients With Chronic Whiplash-Associated Disorders

To date, the authors are unaware of any RCTs that have addressed the efficacy of physiotherapy for chronic whiplash and have found only one case series concerning these patients. Hence, they cannot provide evidence-based recommendations for these patients and must rely on consensus among experts. The guideline committee assumes that chronic whiplash shows similarities with other chronic pain conditions, such as chronic nonspecific low back pain, neck pain, fibromyalgia. Therefore, it was decided that the treatment strategy for chronic WAD may be similar to that for chronic pain in general. The literature was searched for chronic pain interventions in the same databases and in the same rigorous manner as described before, and 12 systematic reviews were identified on the effectiveness of physiotherapy treatment for chronic nonspecific pain, e.g., low back pain, neck pain, and fibromyalgia.

The systematic reviews seem to indicate that exercise therapy, multidisciplinary treatments, and behavioral therapies are favorable in the management of chronic pain, particularly regarding return to normal activities and work. Referring to this evidence, it was decided to base the therapeutic approach for chronic whiplash on advice, education, and exercise therapy using behavioral principles.

Recommendations for the Diagnostic and Therapeutic Process

The Diagnostic Process

History Taking. To provide insight into the health problem, a systematic history is 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. Waddell’s features relevant for patients with WAD (constant pain, diffuse pain, whole limb numbness or pain, arm giving way, intolerance of treatments, emergency admission to hospital for pain management) may help physiotherapists to be alert for symptoms that may predict chronic symptoms. Also, the patient’s current employment situation and demands are investigated. Key points of the history taking are presented in Table 4.

Assessment tools such as the Visual Analogue Scale and the Neck Disability Index may help further to document the health problem (Grade B evidence). To obtain information about the way patients cope with the problem, a questionnaire such as the Coping Strategies Questionnaire can be used (Grade B evidence). Patients who use passive coping strategies may be at a higher risk for the development of chronic symptoms and disabilities than patients who use active coping strategies. The group members recommend the use of these instruments because of their adequate methodologic quality, their relation to the health problem, and their applicability to physiotherapy practice.

Physical Examination. Unfortunately, no validated diagnostic tests (Grade A or B evidence) are available to physiotherapists for whiplash patients. Therefore, only specific tests in the physical examination concerning Grade C or D evidence are recommended. The guideline committee also advises the examination of prognostic factors associated with a delayed recovery and of behavioral signs that may have therapeutic consequences. In consensus, it was decided that the physical examination should preferably include these features:

- General observation, especially for a cervical list or a forward-head posture (Grade C evidence) and for overt pain behavior such as guarding, rubbing, or grimacing (Grade C evidence).
- A regional active examination of the neck, measuring range of motion, quality of movement, and provocation of symptoms (e.g., cervicogenic headache, neck pain, stiffness, dizziness) (Grade D evidence).
- A test for muscular stability and cervical proprioception (Grade C evidence).

In addition, other functions such as muscle strength, tenderness, or regional sensory changes may be tested (Grade D evidence). A pins-and-needles sensation or numbness mentioned in the history taking indicates the need for specific neurologic examination: muscle strength, reflexes, sensation, and the slump test. Neuromotoric deficits require consultation with the general practitioner or neurologist; treatment of this group of patients is beyond the scope of this guideline.

Analytic Process. Combining the information from referral, history taking, and physical examination completes the diagnostic process. Table 5 presents some
Table 6 shows the main treatment goals in different time periods after the accident for both normal recovery and delayed recovery. For example, patients who are referred to physiotherapy in Phase 3 (3 to 6 weeks since the accident) are treated according to the main treatment goals in this phase, which depend on the rate of recovery. If necessary, however, the physiotherapist can change these goals and their treatment and return to the treatment goals for Phase 2. Figure 1 gives a summary of the diagnostic process in whiplash patients.

The Therapeutic Process

Recommendations for Treatment Goals and Interventions in Five Distinct Phases. The time frame of the Quebec Task Force provides a guide for the clinical management of whiplash, combined with the classification of normal or delayed recovery.

Phase 1 (<4 days). Beginning with minor soft tissue damage from the whiplash trauma, a period (<2 days) of inflammation followed by a period (≥6 weeks) of regeneration can be expected. Therefore, the guideline recommends that the patient in Phase 1 “act as usual without pain provocation.”

The treatment goals in Phase 1 are to reduce pain, provide information, and explain the consequences of whiplash. To reach these treatment goals, recommend education and frequently repeated active cervical movements within the comfortable range (Grade A evidence) are recommended. In consultation with the physician, non-steroidal anti-inflammatory drugs may be advised for patients with a high intensity of pain (Grade A evidence). In whiplash patients with normal recovery, treatment goals are set at the level of activities (e.g., lifting, carrying, walking, and performing tasks) and/or related impairments in functions (e.g., cervical range of motion or muscular stability). In whiplash patients with delayed recovery, the main goals are to influence factors that are possibly responsible for poor progress and to improve active coping strategies.

Table 6. Main Treatment Goals in Different Time Periods Since the Accident

<table>
<thead>
<tr>
<th>Treatment Goals</th>
<th>Phase 1 (&lt;4 days)</th>
<th>Phase 2 (4–21 days)</th>
<th>Phase 3 (3–6 weeks)*</th>
<th>Phase 3 (3–6 weeks)†</th>
<th>Phases 4–6 (≥6 weeks)*</th>
<th>Phases 4–6 (≥6 weeks)†</th>
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<tbody>
<tr>
<td>Reducing pain</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Providing information and explaining the consequences of whiplash</td>
<td>x</td>
<td>x</td>
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<td>Improving functions</td>
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<tr>
<td>Increasing activities and participation</td>
<td>x</td>
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<tr>
<td>Minimizing delay in work participation</td>
<td>x</td>
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<tr>
<td>Improving active coping strategies</td>
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<td>x</td>
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* Normal recovery.
† Delayed recovery.
lar, and relying on medication rather than on activity 4,44,54,56 may delay normal recovery.

**Phase 2 (4 days to 3 weeks).** Treatment focuses on increasing function and returning the patient 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.

The following treatment goals are set: providing information, explaining the consequences of whiplash, improving functions (e.g., muscular stability, range of motion, pain) and increasing activity (e.g., reaching, pushing, walking, maintaining postures). Interventions such as education, exercise therapy, and training of functions and activities are advised (Grade A evidence).35,44,56

It is recommended that the patient be informed about the nature of the injury, the absence of serious pathologic changes, the benign natural course of whiplash, posture, ergonomics, the importance of staying active and resuming activities as soon as possible, and the importance of self-efficacy.42 Patients will be taught to increase their activity gradually. They should be informed about the duration of activity and time to recover, and told that activity is helpful and too much rest is not. It is also important to explain that resuming usual activities may be temporarily painful but not harmful in this phase.

**Phase 3 (3 to 6 weeks).** In this phase, functions, activities, and participation are increased to a level of tolerance. The treatment becomes focused on improving activities rather than on pain reduction. Negative beliefs and/or passive coping strategies need to be corrected. Physiotherapists have to make sure that they do not overemphasize the physical aspects and ignore the psychosocial factors.

For normal recovery, the treatment goals are as follows: providing information, explaining the consequences of whiplash, improving functions (e.g., muscular stability, muscle strength, body posture, concentration, attention), increasing activities (e.g., changing postures, activities related to work, housekeeping, or recreation), and increasing participation (e.g., work, housekeeping, social activities). To reach these treatment goals, interventions such as education and training of functions and activities (Grade A evidence) are recommended.35,44,56

For delayed recovery, the main treatment goals are as
follows: improving active coping strategies and self-efficacy. Interventions such as education, exercise therapy based on behavioral principles, and training of functions and activities (Grade A evidence) are recommended.\textsuperscript{35,44,56}

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, for instance, catastrophizing ideas or fear of movement. To prevent or influence fear of movement, it is recommended to build up activities gradually and construct positive movement experiences, especially for activities the patient tends to fear or avoid (Grade D evidence in whiplash, Grade B evidence in chronic pain).\textsuperscript{70–72}

**Phase 4 (6 weeks to 3 months).** Treatment is focused on increasing activities and participation in case of a normal recovery. The main treatment goals are providing information, explaining the consequences of whiplash, and improving the level of activities and participation.

In patients with delayed recovery, the focus is on influencing the way patients cope with their problems. The main treatment goals are improving active coping strategies and acquiring self-control over symptoms and exacerbations. These patients will be actively involved in the treatment process and must be dissuaded from assuming a passive role and waiting to be cured by the physiotherapist.\textsuperscript{72} The recommended interventions are education, training of activities, exercise therapy based on behavioral principles (Grade D evidence in whiplash, Grade A evidence in chronic pain).\textsuperscript{35,40,46,56,61,62,64,65}

In addition, patients in Phases 1 to 3 should be reassured that their symptoms do not signify chronic damage or chronic injury.\textsuperscript{7,8} Explaining the influence of psychologic and social factors on recovery can help patients understand chronic pain and participation problems. These explanations may help patients find alternative explanations for their symptoms (reconceptualization of pain), restructure false disease beliefs, and alter their coping strategies. Factors that are negatively associated with participation in work have to be considered and, if possible, influenced. In consensus, the experts concluded that it is also useful to provide information about alternative ways of performing activities, e.g., to alter the duration of activities, the frequency or velocity of tasks, or the nature of some activities.

The graded activity exercise program based on behavioral principles will help patients improve their level of activities independently of pain and may change their ideas about pain.\textsuperscript{71,74} The activity level should be increased by planned fixed increments over a period of time. The baseline level depends on the present capacity of the patient. Activity levels are increased on a time-dependent, not symptom-dependent, basis. The rate and size of the increments depend on the load tolerance and self-control of the patient. The essence of the program is to develop an individualized graded exercise program that helps the patient increase the level of activity. It is important to tell patients that progressive incremented activity levels may also lead to a progressive decrease in pain.\textsuperscript{13} Graded activation should primarily devote attention to activity levels in normal daily living because many beliefs and kinds of behavior are specific to that setting.

**Phases 5 and 6 (>3 months).** Patients with long-lasting participation problems, disabilities, and impairments have less chance of recovery than do patients with more acute symptoms.\textsuperscript{56,58} The authors recommend the same treatment goals as in Phase 4 and recommend a therapeutic approach, consisting of increasing activities and participation based on behavioral principles (Grade D evidence in whiplash, Grade A evidence in chronic pain).\textsuperscript{40,46,61,62,64,65} Treatment focuses on increasing health behavior with graded activation, promoting feelings of self-control, and thinking positively about pain. The referring physician may be consulted about a specialized psychologic referral for patients with major psychologic 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 (Grade C evidence in whiplash, Grade A evidence in chronic pain).\textsuperscript{31,32,47,62,66}

**Evaluation.** The authors recommend 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 Analog Scale of pain for impairments, Coping Strategies Questionnaire for coping and self-control). It is important to inform the general practitioner about the patient’s progress and reasons for terminating or continuing treatment. The authors recommend communicating with the referring physician if the patient’s health state changes minimally or not at all. Treatment should be terminated if the health problem is resolved or if the treatment goals are reached. Treatment should also be terminated and the referring physician contacted if no more positive treatment effects can be expected. Figure 2 shows a summary of the therapeutic process.

**Discussion**

This guideline may be considered as a state-of-the-art document that assists physiotherapists to make diagnostic conclusions and therapeutic decisions. The main benefits of the clinical practice guidelines are to improve the quality of care, to provide uniformity in care, and to make physiotherapy more transparent to the referring physician and to patients.\textsuperscript{19,27,28,55} The clinical practice guidelines are not intended to be applied rigidly (no “cookbook therapy”) but should be followed in most cases. Physiotherapists may deviate from the guideline if there are good reasons to do so. The content of this guideline is based on scientific evidence when it was
available. Unfortunately, evidence related to the diagnosis and treatment of WAD was sparse and often of poor methodologic quality. Conclusions of systematic reviews formed the main basis of intervention recommendations. On the basis of recent evidence, the authors support the active approach of the Quebec Guideline for patient care.35,44,54 Because not all recommended interventions are evidence based, this guideline may contain some bias. A risk of consensus-based recommendations is that these recommendations may be wrong or inferior to other options.77 Users of guidelines must be able to determine which parts are based on evidence and which parts are based on consensus among experts. Grol et al20 have shown that recommendations that are based on evidence are followed more often than those that were not.

Evidence-based recommendations should not be regarded as the optimal treatment for each patient. Patient characteristics in research may be different from individual patient characteristics in daily practice, which makes it difficult to estimate whether the results of these studies are applicable to individual patients. The use of guidelines requires the physiotherapist to be constantly aware of specific patient characteristics and the applicability of evidence-based recommendations. This will help physiotherapists in decision making and in optimizing the quality of care.

The present guideline has been developed primarily for physiotherapists. In the Dutch health care system, physiotherapy is accessible only after referral by a physician. Specific reasons for referral are still unknown. To prevent overmedicalization, not every whiplash patient should be referred for physiotherapy. The physician may adequately treat many patients. The authors assume that providing adequate information, explaining the consequences of whiplash, explaining why chronic pain develops in some patients, and advising patients to increase activities gradually can also be performed by physicians. This means that parts of this guideline may also be useful to physicians. When medical professionals have knowledge about the guidelines of allied health professions (and vice versa), the authors believe that the quality of health care can be further improved and uniform care can be provided by different professionals.

An important goal of this guideline is to prevent chronicity in whiplash patients. The presence of prognostic factors, such as decreased mobility of the cervical spine, pre-existing neck trauma, and some of Waddell’s features, should alert physiotherapists to the possibility of chronicity. However, the authors do not know the relative strength of each of these potentially prognostic factors. More research is needed to develop a prognostic patient profile consisting of factors that predict outcome in whiplash patients. An early distinction between whiplash patients with either a normal or a delayed recovery would allow early selection of patients who need additional treatment such as physiotherapy and would help to set treatment goals. Furthermore, given the scarcity of scientific evidence, the authors strongly recommend that

Figure 2. Summary of the therapeutic process in whiplash patients.
more RCTs of high methodologic quality be conducted on the effectiveness of physiotherapy interventions for WAD, particularly regarding education, exercise therapy, and graded reactivation for patients with chronic WAD.

To maximize its effect, a guideline should be evidence based, feasible, and easily applicable to clinical practice. The results of the field test showed that the guideline was clear and easy to understand (84%), that the recommendations were adequately described and were compatible with existing views, and that the language was clear and consistent. Seventy-seven percent of the physiotherapists considered that the guideline was specific for whiplash, that the recommendations provided detailed advice regarding appropriate strategies in different situations and in different patients, and that the guideline explained clearly which prognostic factors should be taken into account. Criticisms concerned the scope of the guideline, the distinction between normal and delayed recovery, and the treatment period. Because most physiotherapists were not aware of the classification of WAD according to the Quebec Task Force, the authors added Table 1 to the guideline. To enable patients with normal recovery to be distinguished from those with delayed recovery, the authors decided in consensus that a patient demonstrates delayed recovery if there are no or only small improvements in the level of activities or participation within 4 weeks after the whiplash trauma. Most of the physiotherapists (77%) found that the guideline was applicable in daily practice, although the use of specific outcome measures, such as the Neck Disability Index, is not yet considered “usual care” in The Netherlands, and not every physiotherapist has knowledge of psychosocial factors. Furthermore, the field test showed again that 77% of the physiotherapists found that the guideline was based on scientific evidence and that the evidence was straightforward and not conflicting.

Physiotherapists who use this guideline need to understand the natural course of whiplash, the influence of prognostic factors, the available scientific evidence, and the principles of behavioral therapy. Moreover, they need skills in communication, training of functions and activities, and behavior modification. The authors acknowledge that behavior modification is not within the primary scope of physiotherapy, but they are convinced that physiotherapists can appropriately use behavioral principles to change the movement behavior of the patient. Because education and progressive exercises are important components of behavioral therapy, the authors believe that physiotherapists are able to provide this kind of behavioral therapy. By influencing the ability to carry out activities, and demonstrating that movement or activity is not harmful and may relieve symptoms, physiotherapists may contribute to movement behavior modification and to changes in inadequate cognition about pain and disability. Newton et al41 showed that personal experiences are more powerful to change behavior than giving information and advice only.

The use of specific outcome measures to evaluate different dimensions of the health problem is not yet “usual care” in The Netherlands. Nevertheless, the authors emphasized the importance of the use of specific outcome measures in the management of whiplash patients to evaluate the rate of recovery in a reliable and valid way. Unfortunately, the Coping Strategies Questionnaire has not yet been validated in Dutch, and hence the authors were not able to recommend this outcome measure in the Dutch version of the clinical practice guideline in spite of its additional value in clinical practice.

An important issue in the development of guidelines is its implementation. Guidelines that are not implemented or used properly are useless. Some important attributes that determine compliance with guidelines are these: the guidelines should be compatible with existing values among patients, they should not demand too much change in existing routines, and they must be defined precisely and based on evidence. These attributes have been taken into account in the development process. Implementation activities are planned for the future. For useful implementation, the development of effective strategies is of the utmost importance.

### Conclusion

A clinical practice guideline for physiotherapy management in whiplash patients has been developed to assist physiotherapists with providing appropriate care. Unfortunately, evidence was sparse, and consensus among experts was also used in different parts of the guideline. The guideline reflects the current state of knowledge about effective and appropriate physiotherapy care of whiplash patients. More and certainly better quality research is needed to validate this clinical practice guideline.

### Key Points

- A “best evidence” guideline for patients with whiplash-associated disorders Grades I and II is developed to assist physiotherapists in the decision making of daily practice.
- The guideline is based on the available evidence and consensus among experts.
- The biopsychosocial model is used to approach the consequences of whiplash trauma.
- An early active strategy is recommended to improve functions, increase activities, and prevent chronicity.

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### References


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