

## Treatment and Rehab Protocols for Whiplash Injury

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The condition most commonly referred to as "whiplash" is a complex reaction of the body to impact and rebound forces such as those occurring in rear-end vehicle collisions. Cervical acceleration/deceleration syndrome (CADS) shows positive response to a program of comprehensive chiropractic care based on systematic evaluation and active rehabilitation of the cervical spine region.<sup>1</sup>

Historically, treatment for CADS involved rest, immobilization, and medication for pain. Under such protocols, it's not surprising that full recover was expected for only half of all CADS patients.<sup>2,3,4</sup> The modern chiropractic protocol of early movement, rehabilitative exercise and spinal manipulation strives to achieve the greatest level of functional recovery for the individual.<sup>3,5</sup>

### Evaluation

Because CADS injuries primarily involve soft tissue in the cervical region, which is composed of more than 100 muscles and ligaments, damage may be difficult to demonstrate objectively.<sup>3</sup> Evaluation should begin with a thorough review of the patient's symptoms, history of similar injuries, and possible complicating factors, such as disc disorders or arthroses. It is helpful to clarify the dynamics of the injury by reviewing this sequence of a rear-impact collision:<sup>6</sup>

1. The body is projected forward in a linear horizontal direction.
2. The head maintains its initial position by inertia, and is then thrust abruptly backward before the neck muscles relax to permit motion.
3. As the body stops suddenly against the back of the vehicle seat, a rebound action "whips" the head and neck forward. The rebound usually generates a greater force than the original impact.<sup>2</sup>

Spasm and swelling from acute CADS injuries may require an immediate, thorough examination to be postponed. Some injuries may not be recognizable until hours after trauma has occurred.<sup>7</sup> It is important to make an initial observation of mental status, signs of bruising or abrasions, and areas of local swelling.

Palpation of muscles and insertion points, bony landmarks, joint interfaces, and interspinous spaces precede orthopedic and provocative testing. Range of motion tests encompassing active, passive, and resisted movements can help define specific structures involved, as well as subtle neurological injuries. Sensory evaluation, quantification of pain with patient rating scales, and cervical radiographs can further reveal the extent and nature of injury.

### Adjunctive Approaches to Treatment

There have been several classification systems developed to rate CADS injuries by severity of injury

or by loss of function (see Table 1). Chiropractors can use these to develop treatment procedures and exercise recommendations which are consistent with a patient's capabilities and tolerances.

The extension created on impact strains anterior elements of the cervical vertebral column. These elements include intervertebral discs, anterior longitudinal ligament, prevertebral muscles, and the esophagus or pharynx. Hyperextension also will elongate the sternocleidomastoid muscle. Posterior structures that undergo compression during CADS include the cervical zygapophysial joints and spinous processes.<sup>8</sup>

A classification system defines five grades of injury severity:

Table 1. Croft's Classification System of Injury Severity<sup>4</sup>

Grade	Characteristics
Grade I	<u>Minimal</u> : No motion limitation, no ligament injury, no objective neurological findings.
Grade II	<u>Slight</u> : Motion limitation, no ligament injury or objective neurological findings.
Grade III	<u>Moderate</u> : Motion limitation, some ligament injury, objective neurological findings.
Grade IV	<u>Moderate/Severe</u> : Motion limitation, ligament instability, objective neurological findings, fracture or disc derangement.
Grade V	<u>Severe</u> : Requires surgical management/stabilization.

Croft's recommendation for duration of treatment by grade of injury notes a maximum of 10 weeks for Grade I cases; 29 weeks for Grade II; up to 56 weeks for Grade III; unspecified continuing care for Grade IV; and post-surgical chiropractic care and rehabilitation for Grade V.<sup>4</sup>

A systematic approach to healing is represented in recently published phases of healing (see Table 2).<sup>9</sup> While the numbers differ from Croft's system, the recognition of specific phases of healing with specific therapeutic needs can promote better understanding of treatment requirements and likely outcomes by the professional, patient, insurer, and attorney -- the "big four" parties in many whiplash accidents.

Table 2. Phases of Healing<sup>9</sup>

Phase	Characteristic	Duration	Treatment Goal
Phase 1	Acute Inflammation	2-3 days	No inflammation
Phase 2a	Tissue Repair	1 da.-3 wks.	Full, pain-free, passive ROM
Phase 2b	Tissue Repair	1 da.-3 wks.	Full, active ROM, no resistance
Phase 3	Remodeling	3 wks.-12 mos.	Full, active ROM, appropriate speed and resistance

### A Therapeutic Model

Based on the rating and therapeutic guidelines above, the following treatment sequence can be followed with CADS injuries:

Phase 1: Provide protection and rest for cervical spine. Use cervical collar, cold packs, and cervical support pillow that creates flexion.

Phase 2a: Passive mobility is introduced, and cervical collar use diminishes. Cervical support pillow creates extension during bed rest.

Phase 2b: Patient begins to achieve mobility. Begin appropriate manipulation. Continue extension support from cervical pillow. Introduce rehabilitative exercise with patient wearing cervical collar to limit range of motion.

Phase 3: With patient achieving full function, continue rehabilitation exercises without cervical collar. Continue recommended manipulations.

Support given to affected structures is a key consideration in this treatment regimen. Pillow selection is of prime importance to provide the best possible support for injured cervical structures. Conventional bed pillows can create plastic deformation and encourage long-term instability in the spine and soft tissues. Specially designed cervical support pillows support the lordotic curve and promote proper alignment.

A good cervical collar is also an important element in whiplash care. Choose a design that adapts as needs change with healing. A semi-flexed position is required for better support in the presence of pain and swelling. A normal lordotic posture with maximal support for joint healing should be maintained in later phases of healing.

### Rehabilitative Exercise

Progress becomes more marked when a patient is able to participate in therapeutic exercise. Activation of cervical muscles can stimulate neurological coordination, provide controlled stress for ligament healing, and mobilize stiff, tight joints.

Biomechanical exercises should be undertaken that complement the patient's level of healing. Low-tech cervical rehab equipment allows pain-free, limited ROM activities for beginning rehabilitation, yet challenges the more advanced cases with full ROM movements.<sup>10</sup>

### References

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