

## Bracing during Exercise

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Bracing is an accepted adjunct to the chiropractic adjustment for over 90% of chiropractors, according to the most recent NBCE survey.<sup>1</sup> Bracing has been shown to be the third most popular nonadjustive technique (after corrective/therapeutic exercise and ice pack/cryotherapy).

Doctors and athletic trainers who deal with on-site sports injuries frequently use ankle strapping as a postinjury treatment. There is a concern that "natural" lower extremity movements may be inhibited by the partial immobilization. Segal, et al. concluded that "ankle fractures treated nonsurgically will regain functional range-of-motion if immobilization in equinus is avoided and early weightbearing with early functional bracing is applied."<sup>2</sup> McIntyre, et al.<sup>3</sup> examined the effects of various foot-ankle taping and wrapping methods in 10 men aged 21 to 32 years who walked for 10 minutes on a treadmill. The wrapping methods which compared with barefoot walking included the Gibney basket weave with the Louisiana heel lock using 2-inch adhesive tape, and the Louisiana heel lock using elastic ankle wrap (Velcro™). The men walked at 4.5 mph on a 15\_ grade. Cinematography was used to record stance phases after various periods of exercise.

All wrapping methods were effective in retraining the immobility of the restrained segments. All of the ankle strapping methods evaluated were equally effective in maintaining consistent immobilization during 10 minutes of uphill treadmill walking. There was no evidence to suggest restriction of the intrinsic shock absorption mechanism.

Hart<sup>4</sup> reviewed the structural properties and clinical applicability of six commonly prescribed cervical orthoses. The orthoses were compared for structure, ease of donning, ease of adjustment, comfort and general clinical applicability. The orthoses examined included the soft cervical collar, the poster-style orthosis, the cervicothoracic-style orthosis and the halo traction system.

Besides the soft collar, more rigid cervical collars of plastic and leather are available. The softer-style orthosis has rigid supports between the anterior thoracic plate and the mandibular support and between the posterior thoracic plate and occipital support. The cervicothoracic-style orthosis provides even more rigidity and attaches to the thorax via a circumferential chest strap. Many designs extend down to the pelvis. The halo traction system consists of skull fixation through invasive pins torqued to a desired pressure into the calvarium of the skull.

The soft cervical collar is easy to don, very comfortable, and affords some vertical support of the cervical spine. The Philadelphia collar offers greater variability in sizes for the desired angle of head and neck position and is more rigid. The four-poster orthosis is comfortable, easily donned, and provides more control for the cervical spine. The Somi orthosis also is comfortable and easily donned and is simple to adjust. It restricts flexion motion well and is quite easy to apply when the patient is supine.

The cervicothoracic-type orthosis is less comfortable and much more difficult to don and adjust, but it restricts more motion than the other orthoses. The halo body jacket should be applied by an orthopedic surgeon for more severe problems of cervical instability. Properly applied, it results in

the greatest intervertebral immobility, particularly in the upper cervical spine. Surprisingly, patients wearing halo traction systems are remarkably comfortable. Minor adjustments can be made by skilled health professionals.

For many of the soft tissue injuries of the neck treated in the rehabilitation center, the soft cervical collar may be used to relieve muscle spasm, pain, and worn during rehabilitative exercise. The soft cervical collar is not indicated if intervertebral immobilization is desired. The soft cervical collar may be used as a first-aid splinting device as well. There are a number of devices designed for use that prevent hyperflexion or hyperextension, depending on the type used that are helpful during the rehabilitation regime.

Micheli, et al.<sup>5</sup> maintain that a spinal brace that maintains adequate positioning of the spine and allows continued participation in normal activities is advantageous during the rehabilitation process. Fifty-two young athletes were treated by Micheli with bracing during rehabilitation over three years; 31 completed treatment and were followed for an average of 15 months.<sup>5</sup> Eight of 12 patients with spondylolytic back pain had excellent results, and four had good results (good result implied full activity participation with some residual pain). Three of six adolescents with discogenic low back pain had good results, two had fair results, and one had a poor outcome. Three patients with apophyseal changes and low back pain had good or excellent results. Treatment of mechanical back pain resulted in eight excellent and two good results. The combined average of good or excellent results for the group was 81%.

Good or excellent results were obtained with bracing in most patients. Most continued full participation in activity while wearing the brace. The stability afforded by bracing during activity and rehabilitation helped in the treatment of back injuries in these patients. The brace functions as both a therapeutic and a protective apparatus. Most recognize that most patients must be weaned from brace wearing. However, during the rehab phase of recovery, it is essential that further back injury be avoided. Thus, it is common during the early stages of rehabilitative exercise for the patient to wear the appropriate orthosis.

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### *References*

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