

**The Saunders Group, Inc.**

# **Saunders Cervical Traction**

**Effective Treatment for Neck Pain and Dysfunction**

A comprehensive guide to unique features and therapeutic benefits of the Saunders Cervical HomeTrac<sup>®</sup> Deluxe, including *Frequently Asked Questions*, and a summary of medical literature.

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# The Saunders Cervical HomeTrac<sup>®</sup> Deluxe

## Distinguishing Features and Therapeutic Benefits

The Saunders Cervical HomeTrac Deluxe is different from any other home cervical traction device on the market. It is not appropriate to substitute a different cervical traction device when the physician specifically requests a Cervical HomeTrac Deluxe. Here are the reasons why:

1. **The Cervical HomeTrac Deluxe provides a therapeutic force of up to 50 lbs. No other home cervical traction device delivers adequate force to treat conditions requiring intervertebral separation.** Most home cervical traction devices are limited to 20 lbs force. Twenty pounds is not a sufficient therapeutic force for many patients, especially those with diagnoses requiring separation of the intervertebral spaces for therapeutic effect (e.g., herniated disc, degenerative disc disease, foraminal stenosis, etc...). The medical literature clearly indicates that 25-45 lb (11-20 kg) force is necessary to demonstrate a measurable change in the posterior cervical spine structures.<sup>2,3,11,14</sup> There is no evidence that mid and lower cervical spine separation occurs at forces less than 20 lbs.
2. **The Cervical HomeTrac Deluxe allows traction in the supine position. Traditional over-the-door traction is applied in the seated position.** Research reveals that supine cervical traction is superior to sitting. Deets, et al<sup>7</sup> found compression or narrowing of the joint space with cervical traction applied in the sitting position. When the same force was applied in supine, separation was noted. The authors attributed the problem to muscle guarding and inability to relax during the seated treatment.
3. **The Cervical HomeTrac Deluxe ensures continuity between home and clinical treatments.** Many clinicians prescribe home traction after it has been shown that the patient benefits from traction treatments in the clinic. The most common method of administering clinical traction is with the Saunders Clinical Traction Device. The Saunders Cervical HomeTrac Deluxe is the only home device that truly *replicates* the treatment received in the clinic.
4. **The Cervical HomeTrac Deluxe ensures accurate force delivery.** The Cervical HomeTrac Deluxe is the only home cervical traction device available that has a gauge to indicate exactly how much force is being applied. Patients can follow their health care practitioner's instructions precisely, ensuring a safer, more effective home treatment.
5. **The Cervical HomeTrac Deluxe does not aggravate TMJ disorders.** The Cervical HomeTrac Deluxe does not contact the chin or place any force on the temporomandibular joints (TMJ). Conventional cervical traction methods use head halters that fit under the chin, which transmits force through the teeth to the TMJ. This can cause aggravation of the temporomandibular joints.<sup>4,9,10,22</sup>

# **Cervical Traction Frequently Asked Questions**

## **What are the Indications for Cervical Traction?**

Cervical traction is most beneficial in these cases: A) herniated disc; B) any condition in which mobilization and stretching of soft tissue is desired; and C) any condition in which opening the neural foramen is desired. Cervical traction can also help relieve headaches and soft tissue stiffness if done correctly (with the force pulling from the occiput and not the chin).

## **Why Should I Avoid Head Halters That Contact the Chin?**

Conventional cervical traction methods use head halters that fit under the chin. During a cervical traction treatment using one of these head halters, force is transmitted through the chin strap to the teeth and the temporomandibular joints become weight bearing structures. This can cause aggravation of the temporomandibular joints. The exact amount of force on the chin depends upon the design and adjustment of the head halter, the direction (flexion or extension) of the traction force and the amount of the traction force. Some head halters are better than others. Nevertheless, even when the utmost care is taken to minimize the force on the chin, there often exists enough force to cause an undesirable effect on the temporomandibular joints.

Crisp<sup>4</sup> and Shore, Frankel and Hoppenfeld<sup>22</sup> have shown that some patients experience considerable discomfort in the temporomandibular joints with traditional cervical traction. This is particularly true if an abnormal dental occlusion exists such as the absence of posterior teeth. In some cases, the discomfort is so great that the treatment has to be discontinued. With advancing age, the tissues become more susceptible to disruption and joint trauma, which may be irreversible.<sup>9</sup> Franks suggests that cervical traction involving force on the jaw should be carried out with caution. He reports that, in the older patient particularly, excessive pressure on the jaw can lead to intracapsular bleeding and hematoma in the temporomandibular joint.<sup>10</sup>

Another undesirable effect of the head halter is that the force applied to the chin tends to cause cervical extension. Since many patients with cervical problems have a forward head posture, it is almost always undesirable to increase upper/mid cervical extension.

## What Is the Optimum Angle for Cervical Traction?

Traditionally cervical traction has been done with the head and neck in some degree of flexion. Some clinicians believe that the greater the angle of flexion, the greater the intervertebral separation in the lower cervical spine. Thus it is a common belief that an angle of 20° to 30° of flexion is best for treating a lower cervical problem. The reference most often cited for the rationale is a study by Colachis and Strohm.<sup>2</sup>

While this study does indeed state in the abstract and conclusion that, "... the amount of separation increases with flexion of the cervical spine", the clinical relevance of this fact should be questioned when one takes a closer look at the data presented:

Force	Flexion Angle	Posterior Separation*	Anterior Separation*
30 lbs	6°	+1.6 mm	+0.3 mm
30 lbs	15°	+2.4 mm	+0.2 mm
30 lbs	20°	+2.7 mm	-0.2 mm
30 lbs	24°	+3.4 mm	-0.6 mm
0 lbs	6°	0 mm	0 mm
0 lbs	20°	+0.7 mm	-0.3 mm
0 lbs	24°	+1.0 mm	-0.6 mm

\* For this study, the distance from C2 - C7 was measured at both the posterior and anterior aspect of the vertebrae.

While it is true that posterior separation does increase with more flexion, anterior separation *decreases* with flexion. Compression actually occurs at 20° and 24° of flexion. Thus, the commonly held belief that separation is greater with increased angles of flexion is only true when referring to the posterior vertebral bodies.

Clinicians must first address exactly what it is that they want to separate when deciding upon the optimal angle of cervical traction. In most cases, clinicians should try to achieve a combination of a posterior and anterior stretch. Since the most common postural problem related to the cervical spine is the forward head posture, treatment goals should be to increase upper/mid cervical spine flexion and lower cervical/upper thoracic spine extension. In other words, the goal of treatment is to decrease the curves of the cervical and upper thoracic spine.

Thus, the ideal traction device will flex the head and neck somewhat, but pull at a relatively flat angle. A 15° angle accomplishes this because the posterior aspect of the head is slightly in front of the posterior aspect of the trunk in a normal, desired standing posture. If the clinician's goal is to increase the space in the intervertebral foramen, it might be tempting to increase the flexion angle beyond 15°. However, caution should be used when increasing the flexion angle for this purpose, since the space available for the spinal nerve in the intervertebral foramen may decrease with flexion beyond the neutral or straight position of the spine.<sup>16</sup>

To summarize, we recommend the 15° angle of pull for nearly every clinical indication. In some cases, a greater angle may be necessary for patient comfort or to accommodate severe postural deformities.

## **How Much Force Should Be Used for Cervical Traction?**

We have found that 25-40 lbs of force for the mid and lower cervical spine is often clinically effective in conditions where a separation of the intervertebral space is desirable. Examples of these conditions include herniated cervical disc, interforaminal nerve root encroachment, degenerative disc or joint disease and facet joint impingement. In other conditions where the muscles are primarily affected, less force may be effective. Examples include suboccipital or upper trapezius muscle tension or shortening. As little as 10 lbs force may be necessary when treatment is directed to the upper cervical area.<sup>6</sup>

How much is too much? Certainly, patient comfort and clinical response should be the guide. We have successfully used up to 50 lbs without any adverse results when working up to this level gradually. However, we have found that 50 lbs is rarely needed for good clinical results, and our experience and the clinician feedback we have received confirm that 25-40 lbs is typically an adequate and effective force.

## **Why Should I Insist on the Supine Position for Cervical Traction?**

Traditional over-the-door cervical traction devices require a seated treatment position. We do not believe the seated position is effective, and in some cases it can actually cause more problems. Research confirms that the supine position is superior.<sup>3,7,11</sup> Why is this so?

First, it is difficult to relax in the seated position, particularly with an awkward contraption around the face and jaw. Some researchers have actually found compression or narrowing of the joint space with application of seated cervical traction. This narrowing is often attributed to muscle guarding and the patient's inability to relax during traction.<sup>7</sup>

Second, it is difficult to prescribe the correct amount of force when traction is applied in the seated position. The average head weighs 10-12 lbs (4-6 kg). Since the seated position requires that the traction force must lift the weight of the head, should the clinician add 10-12 lbs to the recommended treatment force? If the patient is co-contracting the cervical muscles during treatment, how much force is actually being applied to the structures of the spine? What is the proper balance of adequate therapeutic force vs. excessive force that causes muscle guarding or inability to relax? If cervical traction was applied in the supine position during clinical treatments (most common), how does this translate to a seated home unit? Questions like these lead to guesswork and poor patient compliance.

Finally, it is not possible to achieve adequate treatment force in the seated position with an over-the-door device, because over-the-door devices deliver a maximum of 20 lbs force.

## Can You Give Me Some Common Treatment Guidelines for Using the Cervical HomeTrac?

While every patient will need individualized consideration, here are some general guidelines for cervical traction treatment. These guidelines are not meant to be a substitute for good clinical judgment and experience. For more detailed information, refer to the textbook, *Evaluation, Treatment and Prevention of Musculoskeletal Disorders, Part I - The Spine, 4<sup>th</sup> Edition*.<sup>21</sup>

Note that if home traction is being used to supplement or follow clinical treatment, the same protocol that was used in the clinic should be followed at home.

1. Treatment Forces: Generally, 25-40 lbs of force is both safe and effective for most clinical conditions. However, if this is your patient's first trial with traction, or if the patient's condition is irritable, it is wise to start at a lower level and gradually increase the force over several sessions. The patient's symptoms should always be the guide. A little post-treatment muscle soreness in the neck is common, but too much soreness or an increase in peripheral symptoms is a sign that the force may have been increased too quickly.
2. Treatment Times: For treatment of herniated disc, we recommend keeping the treatment times relatively short—in most cases 5-10 minutes. Herniated disc treatment is based on the theory that traction causes decreased intradiscal pressure. The resulting "suction force" causes disc reduction. A lengthy treatment period may cause the disc to imbibe excessive fluid and reverse any beneficial effects.<sup>21</sup> For non-disc conditions, a 10-20 minute session is recommended. The general rule is: The higher the force, the lower the treatment time. We rarely use traction for more than 20 minutes.
3. Frequency and Duration: Initially, cervical traction may need to be performed daily. Patients can be weaned off traction as the condition improves and they are able to tolerate more exercise. For chronic conditions, ongoing traction may be beneficial to manage symptoms. A major benefit of prescribing home cervical traction is the fact that multiple treatments can be done in a single day—this is particularly beneficial for acute and subacute conditions.
4. Static vs. Intermittent Mode: In most cases, the static mode of traction is preferred, especially when treating herniated disc or irritable conditions. Sometimes, an intermittent method is preferred for patient comfort. In such cases, we recommend at least a 60 second hold period (e.g., 60 second hold, 10 second rest).

# **Cervical Traction Efficacy in Medical Literature**

Cervical traction has been used for many years for cervical pain and radiculopathy, as well as for relief of whiplash associated disorders and headache. The following pages summarize several good quality articles describing the effectiveness of cervical traction:

## **Cervical Spine Disorders – A Comparison of Three Types of Traction, by Zylbergold and Piper<sup>24</sup>**

This was a randomized clinical trial to compare the effect of intermittent, static and manual traction on cervical spine disorders. One hundred patients (mean age 53 years; standard deviation 12.6 years) were randomly assigned to one of the three types of traction or a fourth group, which received no traction. The cervical disorders of cervical disc disease (59 patients), osteoarthritis (21 subjects), spondylosis (7 patients) and strains (21 patients) were distributed so that the groups were statistically equivalent. Each group received instruction in back care, moist heat for 15 minutes, a program of range of motion and isometric exercises and assigned traction or no traction. Treatment was given twice weekly for 6 weeks. Pre and post treatment measures of cervical ROM, medication use and present pain intensity assessed by using the McGill Pain Questionnaire were compared.

Although all of the patients improved significantly, patients receiving traction had better outcomes in terms of cervical spine mobility, decreased pain and less medication use. The authors concluded that cervical traction should be included in the treatment of cervical disorders.

## **Cervical Radiculitis: Treatment and Results in 82 Patients, by Honet and Puri<sup>12</sup>**

Patients were classified as to the severity of radicular symptoms. Depending upon severity, they were placed in one of three treatment groups. Patients with minimal symptoms received over-the-door home traction at 15-20 lbs. Patients noted to have moderate pain with more profound clinical neurological deficit were treated as outpatients and required relatively heavier force (15-55 lbs cervical traction on a clinical device in the supine position). The few patients with severe, unrelenting pain were hospitalized.

Fifty-eight of the 82 patients across all categories had "excellent" results, and eight patients had "good" results. Of the 16 patients with "poor" results, 13 were in the severe (hospitalized) group, and 9 of those patients went on to have surgery.

The results of Honet and Puri's study indicate that patients with moderately severe cervical radicular pain can benefit from relatively high force cervical traction. Interestingly, the researchers felt it necessary to give higher force traction in a supine position to the relatively more severe group, whereas patients with only minor symptoms received sitting over-the-door traction.

## **Cervical Traction As A Therapeutic Tool, by Valtonen and Kiuru<sup>23</sup>**

This study is based on 212 consecutive patients diagnosed with cervical syndrome and treated with cervical traction. The mean age was 55 years with a range of 21-80 years. Thirty five percent had symptoms less than 4 months, 24% 4-12 months and 41% longer than 12 months.

The patients were treated with some form of heat and massage to relax the muscles, followed by cervical traction. The traction method was usually supine using a head halter and weight system. The traction was given 3 times per week for 4 weeks in the department of physical medicine.

Sixty-one percent had complete relief or marked improvement of symptoms. The authors concluded that cervical traction is a relatively good means of relieving symptoms of cervical syndrome.

The authors did not have a follow-up of the study subjects and did not use home cervical traction more frequently and over an extended period of time. The authors felt the infrequent use of traction and the short treatment duration was a significant factor in the failure rate of 39% of the subjects. In spite of these limitations, however, 19% had complete cure and 42% had marked improvement.

The symptoms of this study population were relatively chronic. Considering the chronicity, the results obtained in only 12 treatments over 4 weeks are impressive. Many of the cervical syndrome features progress slowly over a long period of time with symptoms occurring in the fifth and sixth decade (the mean age of this group was 55). Therefore, it is theorized that reversal of symptoms will often require patients to use home traction over an extended period of time to obtain relief of symptoms.

## **Nonoperative Management of Herniated Cervical Intervertebral Disc With Radiculopathy, by Saal, et al<sup>20</sup>**

A longitudinal cohort study of 26 consecutive patients (mean age 43.1 years, range 22-58 years) with cervical herniated nucleus and radiculopathy were followed for more than one year. Twenty-four of the 26 patients were successfully managed with aggressive nonsurgical treatment. The 24 patients returned to full time work duties. Part of the treatment was cervical traction provided in a clinic followed by home cervical traction for all patients.

The authors concluded that a systematically applied nonsurgical treatment for a clearly defined group of patients with symptomatic cervical disc herniation had outcomes equivalent to results of similar patients treated surgically. The nonsurgical treatment included cervical traction for all patients.



## **An Evaluation of Conservative Treatment for Patients with Cervical Disk Syndrome, by Martin and Corbin<sup>15</sup>**

Sixty-one patients (72.2% age 40-70 years, 24.6% age 50-70 years) were diagnosed with cervical disc syndrome by a neurologist. Treatment consisted of various forms of heat and massage followed by cervical traction using a Sayre sling with the patient seated. A ½ inch felt pad was placed between the patient's back teeth to reduce the discomfort of the chin strap force through the TMJ. The authors emphasized the importance of clinician applied vertical traction for several treatments to assure proper treatment method and adequate patient training. To do otherwise results in treatment failure when an over-the-door apparatus is prescribed to be used at home. The heat and massage were given to prepare the patient for traction. Following several traction treatments varied from 1 to 42 with an average of 8 treatments. Fifty-seven percent of the patients continued with home cervical traction, and many continued to use traction for several months following dismissal from the clinic.

Following the initial treatment period 67.2% had definite improvement. At follow-up (6 months to 5 years; average time of 23 months) 77.1% had definite improvement and were able to conduct their daily lives without difficulty. Only 2 patients had an adverse response to traction treatment and they were in the subgroup of 12 (19.7%) patients who required surgical treatment.

The primary treatment was cervical traction. The authors concluded that the primary reason for patient improvement was due to the traction.

## **Cervical Radiculopathy, by Ellenberg, et al<sup>8</sup>**

This review article is based on a 10 year Medline search and the references listed in the literature obtained from the search. The authors described the cervical radiculopathy clinical picture, causes, diagnosis and treatment.

Home traction treatment is recommended; the authors recommend at least 20 lbs (9 kg) distraction force and an appropriate angle of pull. However, the authors caution that over-the-door traction must be instructed properly as TMJ problems may result. Home recumbent (supine) traction is recommended as being more comfortable but it is described as being more difficult to set up. The authors used an over-the-door supine home traction requiring an assistant to apply the traction. Traction at home may be applied several times per day and some patients benefit from using traction on a long-term basis.

## **The Treatment Of Headaches, by Braaf and Rosner<sup>1</sup>**

This is a clinical report of headache treatment using cervical traction. The authors report that in over 90% of their cases no evidence of the common causes of headache could be found. They emphasize that before commencing treatment, whenever possible, a specific diagnosis is critical. If no specific medical cause is found for the chronic headache, definite physical signs have consistently been found in the neck. Localized cervical tenderness, posterior cervical muscle spasm and altered and restricted cervical motion are the most common. These signs are most pronounced during the person's headache but remain during the interval between headaches.

Treatment consisted of supine cervical traction given with a force that did not produce pain. Traction in other than the supine position did not give maximum benefit. The patient was given traction daily for the first week then reduced to 3 times per week for several months even if the headache disappeared in the meantime. Traction was continued at home over an extended period. The authors recommend that the traction force be progressively increased until a maximum is reached for each individual. As the patient improves, exercises for the neck muscles should be begun and progressed. Initially many patients are unable to carry out simple rotation and flexion movements without increasing symptoms. The authors point out that medication may be required to supplement the traction and exercise therapy. However, when the headache is under control all medication should be stopped.

The authors reported complete alleviation of headache in 60% and good results (greater than 50% improvement) in 30% of their cases. The report concludes with two case histories describing the treatment and results and the conclusion that permanent relief to symptoms is possible for the majority of chronic headache sufferers.

## **Whiplash Associated Chronic Headache Treated With Home Cervical Traction, A Case Report, by Olson<sup>19</sup>**

This case report describes the use of the Saunders Cervical HomeTrac for successful alleviation of the patient's headache. Interestingly, this patient did find relief from her headache with over-the-door home traction but the traction was too difficult to apply with consistent force and head halter adjustment. She could only tolerate the traction for 3 to 5 minutes and only used the traction when her headache was very severe. She would obtain only minimal relief during the time the traction was applied, never any lasting relief.

The patient was able to reduce her chronic headache of two years duration using the Saunders Cervical HomeTrac and exercise for 30 days. She reduced her use of Tylenol from 8 tablets per day to two. She continued to have relief at one-month follow-up maintaining her improved condition with self-management. The patient reported, "I now have a life, I can concentrate and carry on a conversation without a headache."

## **Chronic Whiplash Associated Disorder Treated With Home Cervical Traction, by Olson<sup>18</sup>**

This case report describes a variety of unsuccessful interventions from 5 different physical therapy practitioners over the course of 14 months. The patient suffered from chronic head and neck pain post MVA and became angry and frustrated regarding her medical care. Subsequently, she was referred to a new provider and began using the Saunders Cervical HomeTrac and exercise at home, along with careful monitoring and coaching. After 21 visits, her range of motion, strength and function had improved, and her pain reports had decreased substantially.

The results of this case report show success with the combined efforts of home cervical traction using the HomeTrac and carefully prescribed exercise.

## **Clinical Outcome from Mechanical Intermittent Cervical Traction for the Treatment of Cervical Radiculopathy, by Moetti and Marchetti<sup>17</sup>**

This case series examined 15 patients who completed a course of treatment using mechanical intermittent cervical traction to treat cervical radiculopathy. All but one of the patients required between 20 and 35 lbs force to relieve radicular symptoms. The neck disability index was used to measure pain and perceived disability before and after treatment. Eight of the 15 cases has complete symptom resolution, and displayed a final NDI score of less than 10%, indicating an excellent outcome. Patients with symptom duration of less than 12 weeks tended to do better than patients with longer symptom duration.

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