Clinical Practice Guideline: **Mechanical Traction (Provided in a Clinic Setting)**

Date of Implementation: **June 16, 2016**

Product: **Specialty**

Related Policies:
CPG 83: Axial Decompression Therapy
CPG 121: Passive Physiotherapy Modalities
CPG 135: Physical Therapy Medical Policy/Guideline
CPG 155: Occupational Therapy Medical Policy/Guideline
CPG 265: Home Traction Therapy

GUIDELINES

I. Cervical Spine

ASH considers use of cervical mechanical traction as medically necessary for patients who meet all of the following criteria:

- Failure of other evidence-based therapeutic procedures to significantly improve symptoms after 3 weeks.
- Only used in combination with other evidence-based treatments including therapeutic exercise. The therapeutic exercise(s) should not cause aggravation or peripheralization of symptoms.
- Cervical radiculopathy should be supported by the exam findings including provocative testing such as positive shoulder abduction, positive upper limb tension test A, and/or positive neck distraction test.

ASH considers cervical mechanical traction as unproven because there is insufficient evidence for treatment of other conditions or when the above criteria are not met.

II. Lumbar Spine

ASH considers use of lumbar mechanical traction as medically necessary for patients who meet all of the following criteria:

- Failure of other evidence-based therapeutic procedures to significantly improve symptoms after 3 weeks.
- Patient has sciatica or signs of nerve root compression and either peripheralization with extension movements or a positive crossed straight leg raise test.
- Only used in combination with other evidence-based treatments including therapeutic exercise with extension movements. The therapeutic exercise(s) should not cause aggravation or peripheralization of symptoms.

ASH considers lumbar mechanical traction as unproven because there is insufficient evidence for treatment of other conditions or when the above criteria are not met. These guidelines are NOT relevant to axial or spinal decompression therapy.

III. Thoracic Spine

ASH considers mechanical traction applied to the thoracic spine as unproven because there is insufficient evidence for treatment of thoracic conditions or other spinal conditions beyond those outlined in this guideline.

IV. Other Types of Mechanical Traction

ASH considers mechanical traction using a table with moving roller(s) against the spine or paraspinal tissue (e.g., Spinalator) a type of passive mobilization modality (often referred to as "intersegmental traction") that may have limited value in reducing spinal stiffness and muscle tension and is only appropriate as preparatory or adjunctive to spinal manipulative procedures. It should not be used as a stand-alone therapy. It should only be used for a short duration (1-2 weeks) to facilitate manipulations and to transition into an active therapy program.

ASH considers mechanical traction applied to other spinal conditions other than those outlined in this guideline as unproven because there is insufficient evidence to support their use.

CPT CODES AND DESCRIPTIONS

CPT® Code	CPT® Code Description
97012	Application of a modality to 1 or more areas; traction, mechanical

BACKGROUND AND DESCRIPTION

Traction is a therapeutic method used to relieve pain by stretching and separating the vertebrae to help to relieve direct nerve pressure and stress on the vertebral discs. Cervical traction is a common nonsurgical treatment for a herniated disc in the neck that relieves pain by opening up the cervical foramen to reduce pressure on compressed nerve roots exiting the spinal canal. Traction can either be applied manually or by spinal traction devices. This guideline focuses on various mechanical traction devices that provide continuous or intermittent forces to the spine. It has been proposed that cervical traction results in an expansion of the intervertebral spaces, an increase joint mobility, and a stretching muscles and ligaments adjacent to the vertebral bodies, which will improve clinical outcomes in those with neck pain. After 2 minutes of sustained traction, the intervertebral spaces begin to widen. Forces between 20 and 50 pounds are frequently used to achieve intervertebral separation. Continuous or static traction can be applied in a steady amount for specific time periods. Intermittent or cyclical traction involves traction being

applied and released multiple times during one treatment session. Duration of cervical traction can range from a few minutes to 20 to 30 minutes, one to three times weekly.

Traction is used for treatment of low back pain (LBP) as well and it is provided in combination with other treatment modalities, as is cervical traction. Lumbar traction uses a harness (with Velcro strapping) that is put around the lower rib cage and around the iliac crest. Duration and level of force exerted through this harness can be varied in a continuous or intermittent mode. The exact mechanism through which traction might be effective is still unclear. It has been suggested that spinal elongation, through decreasing lordosis and increasing intervertebral space, inhibits pain (nociceptive) impulses, improves mobility, decreases mechanical stress, reduces muscle spasm or spinal nerve root compression (due to osteophytes), releases luxation of a disc or capsule from the zygapophyseal joint, and releases adhesions around the zygapophyseal joint and the annulus fibrosus. So far, the proposed mechanisms have not been supported by sufficient empirical information.

Contraindications and Precautions

Contraindications for Traction include:

- Where motion is contraindicated
- Acute injury or inflammation
- Joint hypermobility or instability
- Peripheralization of symptoms with traction
- Uncontrolled hypertension

Precautions for Traction include:

- Structural diseases or conditions affecting the tissues in the area to be treated (e.g., tumor, infection, osteoporosis, RA, prolonged systemic steroid use, local radiation therapy)
- When pressure of the belts may be hazardous (e.g., with pregnancy, hiatal hernia, vascular compromise, osteoporosis)
- Displaced annular fragment
- Medial disc protrusion
- When severe pain fully resolves with traction
- Claustrophobia or other psychological aversion to traction
- Inability to tolerate prone or supine position
- Disorientation

Additional precautions for cervical traction:

- TMJ problems

EVIDENCE AND RESEARCH

Cervical

Although traction has been used as a treatment for neck pain for decades, its effectiveness is unproven. Large, well designed, randomized controlled trials are needed that evaluate the effect of cervical traction as an adjunct treatment in both chronic and acute neck pain syndromes. Regardless, cervical traction remains a common treatment modality in the treatment of neck pain and radiculopathy. Borman et al. (2008) evaluated cervical traction for the treatment of chronic neck pain. Patients received standard care (hot pack, ultrasound and exercise) or cervical traction + standard care. The main outcome measures of the treatment were pain intensity by visual analog scale (VAS), disability by neck disability index (NDI), and quality of life assessed by Nottingham Health Profile (NHP) Both groups improved significantly in pain intensity and the scores of NDI and physical status of NHP at the end of the therapies ($p<0.05$). Authors concluded that there was no specific effect of traction over standard physical therapy interventions in patients with chronic neck pain. Young et al. (2009) conducted a randomized controlled trial (RCT) on 81 patients with cervical radiculopathy to examine the effects of manual therapy and exercise, with or without the addition of cervical traction, on pain, function, and disability. Patients were randomly assigned to 1 of 2 groups: a group that received manual therapy, exercise, and intermittent cervical traction and a group that received manual therapy, exercise, and sham intermittent cervical traction. Patients were treated, on average, 2 times per week for an average of 4.2 weeks. Results demonstrated there were no significant differences between the groups for any of the primary or secondary outcome measures at 2 weeks or 4 weeks. Authors concluded that the addition of mechanical cervical traction to a multimodal treatment program of manual therapy and exercise adds no significant additional benefit to pain, function, or disability in patients with cervical radiculopathy.

Chiu et al. (2011) investigated the efficacy of intermittent cervical traction in the treatment of chronic neck pain over a 12-week period in an RCT of 79 patients The experimental group received intermittent cervical traction and the control group received infrared irradiation alone twice a week over a period of six weeks. The authors concluded that there were no significant differences between the two groups. Graham et al. (2013) completed a systematic review on physical modalities for acute to chronic neck pain. Of 103 reviews eligible, 20 were included and 83 were excluded. Moderate evidence of benefit in the short term was noted for intermittent traction over placebo for chronic neck pain. No benefit was noted for continuous traction over placebo for whiplash associated disorder (WAD). Moderate evidence of no benefit for continuous traction was noted, as it was no better than placebo for acute whiplash associated disorder, chronic myofascial neck pain or subacute to chronic neck pain. Improved design and long term follow up were suggested for future research.

Raney et al. (2009) sought to determine a clinical prediction rule (CPR) to identify those patients that were likely to benefit from cervical traction and exercise. Patients were randomly selected into the following groups: exercise only, exercise with mechanical traction, or exercise with over-door traction for patients with cervical radiculopathy. Sixty-eight patients (38 female) were included in data analysis of which 30 had a successful outcome. A CPR with five variables was identified: (1) patient reported peripheralization with lower cervical spine (C4-7) mobility testing; (2) positive shoulder abduction test; (3) age > or =55; (4) positive upper limb tension test A; and (5) positive neck distraction test. Having at least three out of five predictors present resulted in a +LR equal to 4.81 (95% CI = 2.17-11.4), increasing the likelihood of success with cervical traction from 44 to 79.2%. If at least four out of five variables were present, the +LR was equal to 23.1 (2.5-227.9), increasing the post-test probability of having improvement with cervical traction to 94.8%. This preliminary CPR provides the ability to a priori identify patients with neck pain likely to experience a dramatic response with cervical traction and exercise. Before the rule can be implemented in routine clinical practice, future studies are necessary to validate the rule. In 2014, Fritz et al. examined the effectiveness of cervical traction in addition to exercise for specific subgroups of patients with neck pain. Patients with neck pain and signs of radiculopathy were randomized to 4 weeks of treatment with exercise, exercise with mechanical traction, or exercise with over-door traction. Secondary outcomes favored mechanical traction at several time points. The validity of the subgrouping rule was supported on the Neck Disability Index at the 6-month time point only. Authors concluded that adding mechanical traction to exercise for patients with cervical radiculopathy resulted in lower disability and pain, particularly at long-term follow-ups. Yang et al. (2017) performed a comprehensive search of current literature and conduct a meta-analysis of randomized controlled trials (RCTs) to assess the neck pain relieving effect of intermittent cervical traction (ICT). The meta-analysis included seven RCTs. The results indicated that patients who received ICT for neck pain had significantly lower pain scores than those receiving placebos did immediately after treatment. The pain scores during the follow-up period and the neck disability index scores immediately after treatment and during the follow-up period did not differ significantly. Authors concluded that ICT may have a short-term neck pain-relieving effect. Some risks of bias were noted in the included studies, reducing the evidence level of this meta-analysis. According to Blanpied et al. (2017), for patients with chronic neck pain with mobility deficits, clinicians should provide a multimodal approach that may include intermittent mechanical/manual traction. They also report that for patients with chronic neck pain with radiating pain, clinicians should provide mechanical intermittent cervical traction, combined with other interventions such as stretching and strengthening exercise plus cervical and thoracic mobilization/manipulation. However, Bier et al. (2018) states that the physical therapist is advised not to use traction. Romeo et al. (2018) conducted a review and meta-analysis of randomized controlled trials (RCTs) on the effect of cervical traction combined with other physical therapy procedures versus physical therapy procedures alone on pain and disability on patients with cervical radiculopathy (CR). Five studies met the inclusion criteria. Mechanical traction had a

significant effect on pain at short- and intermediate-terms and significant effects on disability at intermediate term. Manual traction had significant effects on pain at short-term. Authors conclude that the current literature lends some support to the use of the mechanical and manual traction for CR in addition to other physical therapy procedures for pain reduction but yielding lesser effects on function/disability.

Colombo et al. (2020) investigated the effectiveness of traction therapy in reducing pain for patients with cervical radicular syndrome (CRS) by performing a systematic review with meta-analysis. A total of seven studies (589 patients), one with low risk of bias, were evaluated. An overall estimate of treatment modalities showed low evidence that adding traction to other treatments is statistically compared to other treatments alone. The subgroup analyses were still statistically significant only for mechanical and continuous modalities. Authors concluded that overall analysis showed that, compared to controls, reduction in pain intensity after traction therapy was achieved in patients with cervical radiculopathy. However, the quality of evidence was generally low and none of these effects were clinically meaningful.

Lumbar

According to the Philadelphia Panel Evidence-Based Clinical Practice Guidelines on Selected Rehabilitation Interventions for Low Back Pain publication (2001), mechanical traction for chronic LBP was not effective or beneficial for pain, function, patient global assessment, and return to work. This was based on four (4) RCTs of mechanical traction versus placebo or no treatment and rated as level I (good evidence). A larger Cochrane Collaboration systematic review by Clarke et al. (2009) determined similar results (25 RCTs). Available studies in this review involved mixed groups of acute, sub-acute and chronic patients with LBP with and without sciatica and were all consistent, indicating that continuous or intermittent traction as a single treatment for LBP is not likely effective for these patients. Traction for patients with sciatica cannot be judged effective at present either, due to inconsistent results and methodological problems in most studies (Clarke et al., 2009). An updated Cochrane review published in 2013 by Wegner et al. indicated that traction, either alone or in combination with other treatments, has little or no impact on pain intensity, functional status, global improvement and return to work among people with LBP (with or without sciatica). The effects shown by the included studies were small and not clinically relevant. These conclusions were applicable to both manual and mechanical traction.

One study attempted to determine which subcategory of patients with LBP would most benefit from mechanical traction. Fritz et al. (2007) determined that patients with sciatica, signs of nerve root compression, and either peripheralization with extension movements or a positive crossed straight leg raise test were most likely to benefit from a combined traction and extension-oriented physical therapy intervention. The authors reported improvements in both disability (Oswestry Disability Questionnaire) and fear-avoidance

beliefs (Fear Avoidance Belief Questionnaire) in the combined traction/extension-oriented approach group at two weeks compared to the group that received just an extension-oriented approach. This study provides some initial evidence for the use of traction for the subgroup of patients mentioned above. The primary limitation to this study is the type of traction table used is not one that is typically found in most clinical settings. The authors used a mechanical traction table allowing for modifications of a subject's position in flexion/extension, rotation or side-bending (3-dimensional ActiveTrac table, The Saunders Group, Inc.). The following parameters were utilized: static traction for a maximum of 12 minutes (10 minutes at desired intensity and one minute ramp up/down) at 40% - 60% of the patient's body weight for a maximum of 12 sessions during a 6 week period (four sessions/week during the first two weeks then one session/week during weeks three through six). Thackeray et al. (2016) examined the effectiveness of mechanical traction in patients with lumbar nerve root compression and within a predefined subgroup. One hundred twenty patients with low back pain with nerve root compression were recruited from physical therapy clinics. Using predefined subgrouping criteria, patients were stratified at baseline and randomized to receive an extension-oriented treatment approach with or without the addition of mechanical traction. During a 6-week period, patients received up to 12 treatment visits. Primary outcomes of pain and disability were collected at 6 weeks, 6 months, and 1 year by assessors blinded to group allocation. No significant differences in disability or pain outcomes were noted between treatment groups at any time point, nor was any interaction found between subgroup status and treatment. Authors concluded that patients with lumbar nerve root compression presenting for physical therapy can expect significant changes in disability and pain over a 6-week treatment period. There is no evidence that mechanical lumbar traction in combination with an extension-oriented treatment is superior to extension-oriented exercises alone in the management of these patients or within a predefined subgroup of patients.

The North American Spine Society's clinical practice guideline on "Diagnosis and treatment of degenerative lumbar spinal stenosis" (2011) noted that there is insufficient evidence to make a recommendation for or against traction, electrical stimulation or transcutaneous electrical nerve stimulation for the treatment of patients with lumbar spinal stenosis.

According to the AHRQ publication on Non-Invasive Techniques for Low Back Pain (2016):

- For low back pain with or without radicular symptoms, a systematic review included 13 trials that found no clear differences with inconsistent effects of traction versus placebo, sham, or no treatment in pain, function, or other outcomes, though two trials reported favorable effects on pain in patients with radicular back pain (SOE: insufficient for pain and function).

- For low back pain with or without radicular symptoms, a systematic review included five trials that found no clear differences between traction versus physiotherapy versus physiotherapy alone.
- For low back pain with or without radicular symptoms, a systematic review included 15 trials of traction versus other interventions that found no clear difference between traction versus other active interventions in pain or function (SOE: low for pain and function).
- A systematic review included five trials that found no clear differences between different types of traction.
- Eleven trials of traction in a systematic review reported no adverse events or no difference in risk of adverse events versus placebo or other interventions. Three subsequent trials reported findings consistent with the systematic review.

According to the American College of Physician's clinical practice guideline (2017) on noninvasive treatments for acute, subacute, and chronic low back pain, evidence was insufficient to determine the effectiveness of traction tables/devices. Foster et al. (2018) summarizes that passive electrical or physical modalities, such as traction, interferential therapy, short-wave diathermy, are generally ineffective and not recommended.

Bilgilisoy Filiz et al. (2018) compared the effects of mechanical lumbar traction either in the supine or in the prone position with conventional physical therapy (PT) in patients with chronic low back pain and lumbosacral nerve root involvement in terms of disability, pain, and mobility. Participants (N = 125) were randomly assigned to receive 15 sessions of PT with additional mechanical lumbar traction either in the supine position (supine traction group) or in the prone position (prone traction group) or only PT without traction (PT only group). Patients were assessed at baseline and at the end of the PT sessions in terms of disability, pain, and mobility. Disability was assessed using the modified Oswesty Disability Index; pain was assessed using a visual analog scale, and lumbar mobility was assessed using the modified lumbar Schober test. One hundred eighteen patients completed the trial. All groups improved significantly for all outcomes. In the between-group analysis, improvements of Oswesty Disability Index and visual analog scale were found significantly better in the prone traction group compared with the PT only group. Authors concluded that the addition of traction in the prone position to other modalities resulted in larger immediate improvements in terms of pain and disability, and the results suggest that when using traction, prone traction might be first choice. Kuligowski et al. (2019) completed a study that enrolled 37 people aged 22-35. The subjects underwent radiological evaluation (MRI), which constituted the basis for assigning them to one of two groups: a protrusion group (PRO) or an extrusion group (EXT). During the experiment, the patient was in the supine position while the therapist administered three-dimensional traction using a manual therapy belt. Authors concluded the following: 1. The type of intervertebral disc damage determines the functional status of young people with degenerative disc disease. 2. The study demonstrated and confirmed a positive effect of traction on the functional

status of subjects with lumbar disc herniation. 3. Traction techniques are safe and can be successfully used in the treatment of lumbar disc herniation as noted on MRI. Hirayama et al. (2019) sought to develop a clinical prediction rule (CPR) that predicts treatment responses to mechanical lumbar traction (MLT) among patients with lumbar disc herniation (LDH). The subjects included 103 patients diagnosed with LDH for which they underwent conservative therapy. The subjects received MLT for 2 weeks, and the application of any other medication was left at the discretion of the attending physician. The patients whose ODI after 2 weeks of treatment improved by ≥50% of that at the initial evaluation were defined as responders. Of the 103 subjects, 24 were responders, and the five predictors selected for the CPR were limited lumbar extension range of motion, low-level fear-avoidance beliefs regarding work, no segmental hypomobility in the lumbar spine, short duration of symptoms, and sudden onset of symptoms. For the patients with at least three of the five predictors, the probability of their ODI greatly improving increased from 23.3% to 48.7% compared with the patients without these predictors (positive likelihood ratio, 3.13). Cheng et al. (2020) evaluated the effectiveness of traction in improving low back pain, functional outcome, and disk morphology in patients with herniated intervertebral disks. Seven articles involving 403 participants were included for quantitative analysis. Compared with the control group, the participants in the traction group showed significantly greater improvements in pain and function in the short term, with standard mean differences of 0.44 (95% confidence interval (CI): 0.11-0.77) and 0.42 (95% CI: 0.08-0.76), respectively. The standard mean differences were not significant to support the long-term effects on pain and function, nor the effects on herniated disk size.

Authors concluded that compared with sham or no traction, lumbar traction exhibited significantly more pain reduction and functional improvements in the short term, but not in the long term. There is insufficient evidence to support the effect of lumbar traction on herniated disk size reduction.

Chou et el. (2018) states that clinicians should not offer traction for neck and back pain given lack of effectiveness. Vanti et al. (2020) evaluated the effects of different types of traction added to or compared with conservative treatments on pain and disability for patients with lumbar radiculopathy (LR) in a systematic review and meta-analysis. Eight studies met the inclusion criteria, and 5 were meta-analyzed. Meta-analyses of results from low-quality studies indicated that supine mechanical traction added to physical therapist treatments had significant effects on pain and disability. Analyses of results from high-quality studies of prone mechanical traction added to physical therapist intervention for pain and disability were not significant. These results were also evident at short-term follow-up (up to 3 months after intervention). Authors concluded that the literature suggests that, for pain and disability in LR, there is short-term effectiveness of supine mechanical traction when added to physical therapist intervention.

George et al. (2021) state that physical therapists should not use mechanical traction for patients with chronic LBP with leg pain, based on the lack of benefit when added to other interventions in an updated clinical practice guideline.

PRACTITIONER SCOPE AND TRAINING

Practitioners should practice only in the areas in which they are competent based on their education, training and experience. Levels of education, experience, and proficiency may vary among individual practitioners. It is ethically and legally incumbent on a practitioner to determine where they have the knowledge and skills necessary to perform such services and whether the services are within their scope of practice.

It is best practice for the practitioner to appropriately render services to a member only if they are trained, equally skilled, and adequately competent to deliver a service compared to others trained to perform the same procedure. If the service would be most competently delivered by another health care practitioner who has more skill and training, it would be best practice to refer the member to the more expert practitioner.

Best practice can be defined as a clinical, scientific, or professional technique, method, or process that is typically evidence-based and consensus driven and is recognized by a majority of professionals in a particular field as more effective at delivering a particular outcome than any other practice (Joint Commission International Accreditation Standards for Hospitals, 2020).

Depending on the practitioner's scope of practice, training, and experience, a member's condition and/or symptoms during examination or the course of treatment may indicate the need for referral to another practitioner or even emergency care. In such cases it is prudent for the practitioner to refer the member for appropriate co-management (e.g., to their primary care physician) or if immediate emergency care is warranted, to contact 911 as appropriate. See the *Managing Medical Emergencies (CPG 159 – S)* clinical practices guideline for information.

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