Cigna Medical Coverage Policy- Therapy Services Chiropractic Care

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INSTRUCTIONS FOR USE

Cigna / ASH Medical Coverage Policies are intended to provide guidance in interpreting certain standard benefit plans administered by Cigna Companies. Please note, the terms of a customer's particular benefit plan document may differ significantly from the standard benefit plans upon which these Cigna / ASH Medical Coverage Policies are based. In the event of a conflict, a customer's benefit plan document always supersedes the information in the Cigna / ASH Medical Coverage Policy. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document. Determinations in each specific instance may require consideration of:

1) the terms of the applicable benefit plan document in effect on the date of service
2) any applicable laws/regulations
3) any relevant collateral source materials including Cigna-ASH Medical Coverage Policies and
4) the specific facts of the particular situation

Cigna / ASH Medical Coverage Policies relate exclusively to the administration of health benefit plans.

Cigna / ASH Medical Coverage Policies are not recommendations for treatment and should never be used as treatment guidelines.

Some information in these Coverage Policies may not apply to all benefit plans administered by Cigna. Certain Cigna Companies and/or lines of business only provide utilization review services to clients and do not make benefit determinations. References to standard benefit plan language and benefit determinations do not apply to those clients.

Coverage for chiropractic care varies across plans. Refer to the customer's benefit plan document for coverage details.

When covered, chiropractic care may be subject to the terms, conditions and limitations of the applicable benefit plan's Short-Term Rehabilitative Therapy or Chiropractic Care Services benefit and schedule of copayments. A chiropractic treatment visit is defined as up to a one-hour session of treatment on any given day. Inclusive of this, each date of service is limited to a maximum of 4 timed codes.

Chiropractic care provided to treat an injury or condition that is work-related or was sustained in the workplace may require coordination of benefits (COB). Please refer to the applicable benefit plan document to determine the terms, conditions and limitations of coverage.

If coverage for chiropractic care is available, the following conditions of coverage apply.

GUIDELINES

Medically Necessary

I. Chiropractic services are considered medically necessary when ALL of the following conditions are met:

- The service is aimed at diagnosis, and treatment of musculoskeletal and related disorders and the effects of these on the nervous system and general health
- The service is for conditions that require the unique knowledge, skills, and judgment of a chiropractor for education and training that is part of an active skilled plan of treatment
- The program is individualized, and there is documentation outlining quantifiable, attainable treatment goals.
- The individual's condition has the potential to improve or is improving (and has not reached maximum improvement).
- Improvement is evidenced by successive objective measurements over a defined time frame.
- The services are delivered by a qualified provider of chiropractic services

II. Upper extremity manipulation/mobilization is considered medically necessary as part of a multimodal treatment program for shoulder complaints, dysfunction, disorders and/or pain. If examination/evaluation of any other UE condition indicate restricted joint play, addition of manipulation/mobilization with standard care is reasonable.

III. Use of lower extremity manipulation/mobilization is considered medically necessary as part of a multimodal treatment of ankle inversion sprains. If examination/evaluation of any other LE condition indicate restricted joint play, addition of manipulation/mobilization with standard care is reasonable.

IV. Supportive care, also referred to as ongoing care, or long-term treatment or care, may be necessary as a treatment for individuals who have reached a maximum benefit but fail to sustain the benefit and progressively deteriorate when removed from treatment programs. The potential for the individual to develop dependency on ongoing care should be considered in treatment planning. Once a maximum benefit has been reached, continuing chiropractic care is considered not medically necessary.

<u>Not Medically Necessary</u>

I. Chiropractic services are considered not medically necessary if any of the following is determined:

- Chiropractic services are considered maintenance /preventive:
  - Maintenance/preventive care is defined as elective healthcare that is typically long-term, by definition not therapeutically necessary, but provided at intervals (preferably regular) to prevent disease, promote health and enhance the quality of life.
  - Ongoing preventive/maintenance care may include patient education, screening procedures to identify risk, a home exercise program (HEP), and lifestyle modifications in the hope of promoting optimal health.
- The service is not aimed at diagnosis, and/or treatment of disorders of the musculoskeletal system, and the effects of these disorders on the nervous system and general health.
- The service is for conditions for which therapy would be considered routine educational, training, conditioning, or fitness. This includes treatments or activities that require only routine supervision.
- The service(s) are not expected to result in a practical improvement in the level of functioning within a reasonable and predictable period of time.
- The documentation fails to objectively verify functional progress over a reasonable period of time.
- Improvement or restoration of function could reasonably be expected as the individual gradually resumes normal activities without the provision of skilled therapy services. For example:
  1. An individual suffers a transient and easily reversible loss or reduction in function which could reasonably be expected to improve spontaneously as the individual gradually resumes normal activities;
  2. A fully functional individual who develops temporary weakness from a period of bed rest.
- The treatment visit extends beyond 4 timed unit services per date of service per provider (equivalent to one hour).

- Chiropractic services that do not require the skills of a qualified provider of chiropractic services. Examples include but not limited to:
    - Activities for the general good and welfare of the individual:
        1. General exercises (basic aerobic, strength, flexibility or aquatic programs) to promote overall fitness/conditioning
        2. Services/programs for the primary purpose of enhancing or returning to athletic or recreational sports.
        3. Massages and whirlpools for relaxation
        4. General public education/instruction sessions
    - Activities and services that an individual can practice independently and can be self-administered safely and effectively:
        1. Activities that require only routine supervision and NOT the skilled services of a chiropractor
        2. When a home exercise program is sufficient and can be utilized to continue therapy (examples of exceptions include but would not be limited to the following: if individual has poor exercise technique that requires cueing and feedback, lack of support at home if necessary for exercise program completion, and/or cognitive impairment that doesn't allow the individual to complete the exercise program)
- The physical medicine and rehabilitation modalities are not preparatory to other skilled treatment procedures or are not necessary in order to safely and effectively provide other skilled treatment procedures.
- Modalities that have been deemed to provide minimal to no clinical value independently or within a comprehensive treatment for any condition and/or not considered the current standard of care within a treatment program
    - Infrared light therapy
    - Vasopneumatic device
- Treatments/services that are not supported in peer-reviewed literature and not performed in accordance with this and other applicable standards of practice and clinical practice guidelines or medical policies.
- Services provided to reduce potential risk factors where significant improvement is not expected
- Use of upper extremity manipulation/mobilization as a part of multimodal treatment program for epicondylitis/epicondylalgia and carpal tunnel syndrome.
    - In the absence of contraindications and if examination/evaluation suggest additional findings indicating manipulation/mobilization of UE joints in addition to standard care may be beneficial (e.g., restricted joint play of humeroradial joint, restricted joint play of radiocarpal joint), use of these interventions is reasonable.
- Use of lower extremity manipulation/mobilization combined with multimodal treatment program for the treatment of hip osteoarthritis, knee osteoarthritis, and/or plantar fasciitis.
    - In the absence of contraindications and if examination/evaluation suggest additional findings indicating manipulation/mobilization of LE joints in addition to standard care may be beneficial (e.g., restricted joint play of iliofemoral joint, restricted joint play of the proximal tibiofibular joint)), use of these interventions is reasonable.

II. The following treatments are considered not medically necessary because they are nonmedical, educational or training in nature. In addition, these treatments/programs are specifically excluded under many benefit plans:

- back school
- vocational rehabilitation programs and any program with the primary goal of returning an individual to work
- work hardening programs

III. Duplicative or redundant services expected to achieve the same therapeutic goal are considered not medically necessary. For example:

- Multiple modalities procedures that have similar or overlapping physiologic effects (e.g., multiple forms of superficial or deep heating modalities)
- Same or similar rehabilitative services provided as part of an authorized therapy program through another therapy discipline.

- When an individual receives rehabilitation from a physical therapist, occupational therapist, chiropractor or other rehabilitation professional, each practitioner should provide different treatments that reflect each discipline's unique perspective on the individual's impairments and functional deficits and not duplicate the same treatment. They must also have separate evaluations, treatment plans, and goals. When an individual receives manual therapy services from a physical therapist and chiropractic or osteopathic manipulation, the services must be documented as separate and distinct and must be justified as non-duplicative.
- The medical necessity of neuromuscular reeducation, therapeutic exercises, and/or therapeutic activities, performed on the same day, must be documented in the medical record.

Experimental, Investigational, Unproven

Chiropractic manipulation and adjunct therapeutic procedures/modalities (e.g., mobilization, therapeutic exercise, traction) for treatment of non-musculoskeletal conditions are considered experimental, investigational or unproven.

Use of any of the following treatments are considered experimental, investigational or unproven:

- Dry hydrotherapy/aquamassage/hydromassage
- Non-invasive Interactive Neurostimulation (e.g., InterX®)
- Microcurrent Electrical Nerve Stimulation (MENS)
- H-WAVE ®
- Elastic therapeutic tape/taping (e.g., Kinesio™ tape, KT TAPE/KT TAPE PRO™, Spidertech™ tape)
- Dry Needling
- Vertebral axial decompression therapy and devices (e.g., VAX-D, DRX, DRX2000, DRX3000, DRX5000, DRX9000, DRS, Dynapro™ DX2, Accu-SPINA™ System, IDD Therapy® [Intervertebral Differential Dynamics Therapy], Tru Tac 401, Lordex Power Traction device, Spinerx LDM)
- MedX lumbar/cervical machines
- Cybex back system/Biodex
- Digital radiographic mensuration
- Digital postural analysis
- Thermography
- Spinal/paraspinal ultrasound
- Surface electromyography /paraspinal electromyography
- Iontophoresis or phonophoresis

Massage Therapy

Massage therapy is considered NOT medically necessary when it is provided in the absence of other covered chiropractic modalities or physical therapy/occupational therapy. It must be provided as part of a multi-modal rehabilitation program.

Note: Massage therapy may be provided by several types of providers. To qualify for coverage, the provider must meet the definition of provider contained in the benefit plan. Please refer to the applicable plan language to determine benefit coverage for the rendering provider.

DESCRIPTION

Chiropractic is a health care profession that focuses on disorders of the musculoskeletal system and the nervous system, and the effects of these disorders on general health. Chiropractic services are used most often to treat musculoskeletal and related conditions. Chiropractic services are intended to improve, adapt or restore functions which have been impaired or permanently lost as a result of illness, injury, loss of a body part, or congenital abnormality involving goals an individual can reach in a reasonable period of time Benefits will end when treatment is no longer medically necessary and the individual stops progressing toward those goals. The specific time frames for which one would expect practical functional improvement is dependent on various

factors. A reasonable trial of care for chiropractic services is generally 2-8 weeks and is influenced by the diagnosis; clinical evaluation findings; stage of the condition (acute, sub-acute, chronic); severity of the condition; and patient-specific findings (age, gender, past and current medical history, family history, and any relevant psychosocial factors).

Chiropractic care may be a primary method of treatment for some medical conditions, such as lower back pain, or may complement or support medical treatment for other conditions by relieving the musculoskeletal aspects associated with the condition. Chiropractors may refer patients to the appropriate health care provider when chiropractic care is not suitable for the patient's condition, or the condition warrants co-management in conjunction with other health care providers.

Spinal manipulation (sometimes referred to as a "chiropractic adjustment") is a common, therapeutic procedure performed by doctors of chiropractic. The purpose of spinal manipulation is to restore joint mobility by manually applying a controlled force into joints that have become hypomobile, or restricted in their movement, as a result of a tissue injury. Tissue injury can be caused by a single traumatic event or through repetitive stresses. In either case, injured tissues undergo physical and chemical changes that can cause inflammation, pain, and diminished function. Manipulation, or adjustment of the affected joint and tissues, restores mobility, thereby alleviating pain and muscle tightness allowing tissues to heal. In addition to manual therapy other procedures/modalities, both passive and active, are often used as adjunct treatments throughout the treatment program.

GENERAL BACKGROUND

Chiropractic spinal manipulation requires professional skills to identify spinal segmental joint dysfunction characterized by altered joint alignment, motion, or physiologic function in an intact spinal motion segment. The primary objectives of chiropractic spinal manipulation are to alleviate musculoskeletal pain, muscle spasm, and functional impairment of the spine. This form of manipulation is a therapeutic procedure characterized by controlled force, leverage, direction, amplitude, and velocity (directional, high velocity, low amplitude thrust) (Peterson & Bergmann, 2002).

Response to chiropractic treatment typically occurs within two to eight weeks. The medical necessity of continued chiropractic care is dependent on documented progress toward therapeutic goals. Maximum therapeutic benefit has been reached when the patient fails to show improvement, or when a pre-injury level of functioning has been reached. Chiropractic physicians should document in clinical records the objective findings and subjective complaints that support the necessity for a chiropractic treatment regimen. A treatment plan should be developed with planned procedures/modalities (frequency and duration), measurable and attainable short- and long-term goals, and anticipated duration of care. At a minimum, documentation is required for every treatment day and for each area or spinal segment treated and for each therapy performed. Each daily record should include: the date of service, the total treatment time for each date of service, and the identity of the person(s) providing the services; the type and specific location of CMT including segment(s) adjusted, subluxation listings/dynamic restrictions, direction(s) of corrective thrust(s), and specific technique(s) used; the name of each modality and/or procedure performed, the parameters for each modality (e.g., amperage/voltage, location of pads/electrodes), area of treatment, and total treatment time spent for each therapy (mandatory for timed services). Failure to properly identify and sufficiently document the parameters for each therapy on a daily progress note may result in an adverse determination (partial approval or denial).There should be a reasonable expectation that the identified goals will be met. The following are recommended:

- If conservative care is appropriate, a short course (not to extend beyond eight weeks) is warranted. If the patient demonstrates objective evidence of improvement, additional care may be appropriate.
- The provider should attempt to integrate some form of active care as early as possible. Continued use of passive care modalities may lead to patient dependency and should be avoided.
- Passive modalities may be helpful for short term relief of the acute signs of inflammation (e.g., pain, muscle spasm, swelling, loss of function). The utilization of passive modalities is not considered medically necessary once the acute phase of care is over.
- The utilization of more than 2 passive modalities per office visit is typically considered excessive and is not supported as medically necessary. Use of more than 2 modalities on each visit date should be justified in the documentation.

- These rules hold true for acute, chronic and postsurgical cases. No matter what specific treatment is chosen, it must yield identifiable, objective outcomes to establish the necessity of care.

Duplicated / Insufficient Information

(1) Entries in the medical record should be contemporaneous, individualized, appropriately comprehensive, and made in a chronological, systematic, and organized manner. Duplicated/nearly duplicated medical records (a.k.a. cloned records) are not acceptable. It is not clinically reasonable or physiologically feasible that a patient's condition will be identical on multiple encounters. (Should the findings be identical for multiple encounters, it would be expected that treatment would end because the patient is not making progress toward current goals.)

This includes, but not limited to:

- duplication of information from one treatment session to another (for the same or different patient[s]);
- duplication of information from one evaluation to another (for the same or different patient[s]).

Duplicated medical records do not meet professional standards of medical record keeping and may result in an adverse determination (partial approval or denial) of those services.

(2) The use of a system of record keeping that does not provide sufficient information (e.g., checking boxes, circling items from lists, arrows, travel cards with only dates of visit and listings) should not be submitted. These types of medical record keeping may result in an adverse determination (partial approval or denial) of those services.

Effective and appropriate documentation that meets professional standards of medical record keeping that adequately detail a proper assessment of the patient's status, the nature and severity of patient complaint(s) or condition(s), and/or other relevant clinical information (e.g., history, parameters of each therapy performed, objective findings, progress towards treatment goals, response to care, prognosis.) is expected.

Modalities and Procedures

In some states, Chiropractic physicians are required to hold a specific certification to use physical medicine modalities in practice. The American Medical Association (AMA) Current Procedural Terminology (CPT) manual defines a modality as "any physical agent applied to produce therapeutic changes to biologic tissue; includes but is not limited to thermal, acoustic, light, mechanical, or electric energy" (AMA, 2018). Modalities may be supervised, which means that the application of the modality doesn't require direct one-on-one patient contact by the practitioner; or modalities may involve constant attendance, which indicates that the modality requires direct one-on-one patient contact by the practitioner. Examples of supervised modalities include application of hot or cold packs, mechanical traction, and unattended electrical stimulation. Examples of modalities that require constant attendance include ultrasound, manually applied electrical stimulation, and iontophoresis.

Passive modalities are most effective during the acute phase of treatment, since they are typically directed at reducing pain, inflammation, and swelling. They may also be utilized during the acute phase of the exacerbation of a chronic condition. The use of passive modalities are not generally considered medically necessary unless they are preparatory and essential to the safe and effective delivery of other skilled treatment procedures (e.g. chiropractic manipulation, therapeutic exercise training, etc.). After one or two weeks, the clinical effectiveness of passive modalities begins to decline significantly. The need for passive modalities beyond two weeks should be objectively documented in the clinical record.

The AMA CPT manual defines therapeutic procedures as "A manner of effecting change through the application of clinical skills and/or services that attempt to improve function" (AMA, 2018). Examples of therapeutic procedures include therapeutic exercise to develop strength and endurance, range of motion and flexibility; neuromuscular re-education of movement, balance, coordination, kinesthetic sense, posture, and/or proprioceptive activities; aquatic therapy; and manual therapy techniques (e.g., mobilization/manipulation, manual lymphatic drainage, manual traction); or therapeutic activities using dynamic activities to improve functional performance (direct one-on-one patient contact by the practitioner).

Transition from passive physiotherapy modalities to active treatment procedures should be timely and evidenced in the medical record, including instructions on self/home care. And in most cases, active treatment should be initiated in addition to modality use at a level that is appropriate for the patient.

Active therapeutic procedures are typically started as swelling, pain, and inflammation are reduced. The need for stabilization and support is replaced by the need for increased range of motion and restoration of function. Active

care elements include increasing range of motion, strengthening primary and secondary stabilizers of a given region, and increasing the endurance capability of the muscles. Care focuses on active participation of the patient in their exercise program. Activities of Daily Living (ADLs) training, muscle strengthening, movement retraining, and progressive resistive exercises are considered active procedures. In general, patients should progress from active procedures to a home exercise program.

Certain physical medicine modalities and therapeutic procedures are considered duplicative in nature and it would be inappropriate to perform or bill for these services during the same session, such as:

- Functional activities and ADLs;
- More than one deep heating modality;
- Massage therapy and myofascial release;
- Orthotics training and prosthetic training; and
- Whirlpool and Hubbard tank.

The medical necessity of neuromuscular reeducation, therapeutic exercises, and/or therapeutic activities, performed on the same day, must be documented in the medical record.
Only one heat modality would be considered medically necessary during the same treatment session, with the exception of use of one form of superficial heat and one form of deep heat (i.e., ultrasound or diathermy and hot packs). Use of two forms of deep or superficial heat would not be acceptable. Hot or cold packs should not be used in the absence of other modalities or manipulation and must be part of a multi-modal rehabilitation program.

Exacerbation/Re-injury
According to the CCGPP consensus recommendations for the management of chronic spine related conditions, "An exacerbation is characterized by a return of atypical pain and/or other symptoms and/or pain-related difficulty performing tasks and actions equivalent to the appropriate minimal clinically important change value for the outcome of interest." (Farabaugh, et al., 2010). Once maximum therapeutic benefit has been reached and documented, additional chiropractic services may be warranted when there is an exacerbation of the condition or re-injury. Management of chronic pain conditions involves an understanding and compliance with self-directed home care, and when self-directed care fails to sustain previously achieved gains during exacerbation or re-injury, a short course of treatment (i.e., 1-6 visits per episode) may be necessary (Farabaugh, et al., 2010 [Council of Chiropractic Guidelines and Practice Parameters [CCGPP]).

The evaluation and documentation of the need for chiropractic services for exacerbation or re-injury should include detail surrounding the individuals response to previous and current modalities of treatment, response to absence of treatment, that maximum therapeutic benefit was reached and documented, analgesic pattern use, patient-centered outcome assessment tools, and any other health care services that have been used to manage symptoms (Farabaugh, et al., 2010). Clinical documentation should clearly describe the condition that requires additional treatment sessions, and that the condition is an exacerbation or re-injury.

DOCUMENTATION GUIDELINES

Evaluation
An initial evaluation service is essential to determine whether any services are medically necessary, to gather baseline data, establish a treatment plan, and develop goals based on the data. The initial evaluation is usually completed in a single session. An evaluation is needed before implementing any chiropractic treatment. Initial evaluations include an Evaluation and Management (New Patient or Established Patient E/M) service and may include, as necessary, imaging, laboratory studies, and other diagnostic tests and measures. The initial evaluation service must include: A level of clinical history, examination, and medical decision-making relevant and appropriate to the individual's complaint(s) and presentation;

- Prior functional level, if acquired condition;
- Specific standardized and non-standardized tests, assessments, and tools;
- Analytic interpretation and synthesis of all data, including imaging studies, special tests, lab reports, and/or reports/records from other healthcare providers;
- Objective, measurable, and functional descriptions of an individual's deficits using comparable and consistent methods;
- Summary of clinical reasoning and consideration of contextual factors with recommendations;
- The establishment of a working diagnosis;

- Plan of care with specific treatment techniques or activities to be used in treatment sessions that should be updated as the individual's condition changes;
- Frequency and duration of treatment (treatment dose);
- Functional, measurable, and time-framed long-term and short-term goals based on appropriate and relevant evaluation data;
- Rehabilitation prognosis and discharge plan.

Note: Appropriate range of motion (ROM) testing (CPT codes 95851- 95852) and/or manual muscle testing (MMT) (CPT codes 95831 – 95834), including digital wireless dynamometers and inclinometers or other such electronic device that measures strength and/or ROM using a handheld device are integral within Evaluation/Reevaluation codes. Computerized isokinetic muscle strength and endurance testing using a machine, such as a Biodex, would be considered a physical performance test or measurement using CPT code 97750 – "Physical performance test or measurement (e.g. musculoskeletal, functional capacity), with written report, each 15 minutes."

Treatment Sessions
Chiropractic treatment can vary from Chiropractic Manipulative Therapy alone (CMT CPT codes 98940-98943) to the use of a variety of physical medicine and rehabilitation modalities and procedures depending on the patient's condition, response to care, and treatment tolerance. A chiropractic treatment session lasts up to one-hour on any given day and all services must be supported in the treatment plan and be based on an individual's medical condition. Consistent with Centers for Medicare & Medicaid Services (CMS) Local Coverage Determinations (LCDs), up to a maximum of 4 timed codes (modalities and procedures) will be allowed. Chiropractic services in excess of 60 minutes per day are generally not demonstrated to have additional medical benefit in an outpatient setting. A chiropractic treatment session may include:

- Chiropractic Manipulative Therapy (CMT). A brief evaluation of the patient's progress and response to previous treatment(s) is included in the work value of a CMT.
- Passive physical medicine modalities such as electrotherapeutic and mechanical modalities preparatory to other skilled services
- Active physical medicine procedures such as therapeutic exercise, including neuromuscular reeducation, coordination, and balance;
- Functional training in self-care and home management;
- Functional training in and modification of environments (home, work, school, or community), including biomechanics and ergonomics;
- Manual therapy techniques, including soft tissue mobilization, joint mobilization, and manual lymphatic drainage;
- Assessment, design, fabrication, application, fitting, and training in assistive technology, adaptive devices, and orthotic devices;
- Training in the use of prosthetic devices;
- Skilled reassessment of the individual's problems, plan, and goals as part of the treatment session;
- Coordination, communication, and documentation;
- Reevaluation, if there is a significant change in the individual's condition or there is as need to update and modify the treatment plan.

Documentation of treatment sessions should include at a minimum:

- Date of treatment;
- Specific treatment(s) provided that match the procedure codes billed;
- Total treatment time;
- The individual's response to treatment;
- Skilled ongoing reassessment of the individual's progress toward the goals;
- Any progress toward the goals in objective, measurable terms using consistent and comparable methods;
- Any problems or changes to the plan of care;
- Name and credentials of the treating clinician.

Progress Reports
In order to reflect that continued chiropractic services are medically necessary, intermittent progress reports must demonstrate that the individual is making functional progress. Progress reports may be in the form of an expanded

treatment session note (e.g. S.O.A.P. note format) or a more formal report. Progress reports should include at a minimum:

- Start of care date;
- Time period covered by the report;
- Working diagnoses;
- Statement of the individual's functional level at the beginning of the progress report period;
- Statement of the individual's current status as compared to evaluation baseline data and the prior progress report, including objective measures of the individual's function that relate to the treatment goals;
- Changes in prognosis and why;
- Changes in plan of care and why;
- Changes in goals and why;
- Consultations with other professionals or coordination of services, if applicable;
- Signature and title of qualified professional responsible for the therapy services.

Reevaluation

The Chiropractic Manipulative Therapy (CMT) service includes a brief reevaluation of the patient's condition, as well as documentation of the patient's response to the treatment. Routine use of E/M services is not medically necessary. A reevaluation (an Established Patient E/M service) is indicated when there are new clinical findings, a rapid change in the individual's status, or failure to respond to treatment interventions. There are several routine reassessments that are not considered reevaluations. These include ongoing reassessments that are part of each skilled treatment session, progress reports, and discharge summaries.

The E/M services may include all or some of the components of the initial evaluation, such as:

- Data collection with objective measurements taken based on appropriate and relevant assessment tests and tools using comparable and consistent methods;
- Determining effectiveness of intervention(s) and whether chiropractic care is still warranted;;
- Organizing the composite of current problem areas and deciding a priority/focus of treatment;
- Identifying the appropriate intervention(s) for new or ongoing goal achievement;
- Modification of intervention(s);
- Revision in plan of care if needed;
- Correlation to meaningful change in function; and
- Updating the discharge plan as appropriate.

Standardized Tests and Measures/Functional Outcome Measures (FOMs)

Measuring outcomes is an important component of chiropractors' practice. Outcome measures are important in direct management of individual patient care and for the opportunity they provide the profession in collectively comparing care and determining effectiveness.

The use of standardized tests and measures early in an episode of care establishes the baseline status of the patient, providing a means to quantify change in the patient's functioning. Outcome measures, along with other standardized tests and measures used throughout the episode of care, as part of periodic reexamination/reevaluation, provide information about whether predicted outcomes are being realized. As the patient reaches the termination of chiropractic services and the end of the episode of care, the chiropractor measures the outcomes of the chiropractic services. Standardized outcome measures provide a common language with which to evaluate the success of chiropractic interventions, thereby providing a basis for comparing outcomes related to different intervention approaches. Measuring outcomes of care within the relevant components of function (including body functions and structures), activity, and participation, among patients with the same diagnosis, is the foundation for determining which intervention approaches comprise best clinical practice.

LITERATURE REVIEW

Chiropractic care is most often employed as a treatment for spinal conditions including low-back pain, cervical pain, and thoracic spine disorders. Chiropractic care may be used as treatment for extremity joint dysfunction and temporomandibular joint (TMJ) dysfunction. Most studies involving the long-term safety and effectiveness of spinal manipulation have been done on adult populations. Thus, no generalizations can be made regarding the long-term safety and effectiveness of spinal manipulation for other populations. Evidence in the published, peer-

reviewed, scientific literature has not shown that preventive chiropractic services are effective and improve long-term clinical outcomes.

Massage Therapy
Few clinical trials have been undertaken to assess the effect of this modality alone in the treatment of specific medical conditions. Rehabilitation programs frequently combine massage therapy with one or more other treatment interventions. While there is scant literature regarding the efficacy of this treatment when used as the sole modality, massage therapy has been a part of physical therapy or chiropractic treatment plans for the management of musculoskeletal pain. As an example, for mechanical low back pain, the greatest effects of massage therapy are seen in short term relief of pain. The effects on function were less clear. These therapeutic effects tend to diminish in the longer term (Chou et al., 2016). Massage therapy was also noted as an effective treatment of acute post-operative pain (Chou et al., 2020) and chronic low back pain in the intermediate term (Skelly et al., 2018). Slight functional improvements were noted in the intermediate term for fibromyalgia using myofascial release massage (Skelly et al., 2018; Kundakci et al., 2022).

Chiropractic Care for Conditions Considered Experimental, Investigational, or Unproven:

Scoliosis
Scoliosis, lateral curvature of the spine, is a structural alteration that occurs in a variety of conditions. Progression of the curvature during periods of rapid growth can result in significant deformity, which may be accompanied by cardiopulmonary compromise (Schreiber et al., 2019; Scherl, 2016). Options for treatment of scoliosis include observation, bracing, and surgery. Evidence is insufficient to demonstrate effectiveness of physical therapy (scoliosis-specific exercises, including the Schroth Method), chiropractic treatment, electrical stimulation, or biofeedback to correct, improve or prevent further curvature (Seleviciene et al., 2022; Santos et al., 2022; Fan et al., 2020; Schreiber et al., 2019; Scherl, 2016; National Institutes of Health [NIH]/National Institute of Arthritis and Musculoskeletal and Skin Disease [NIAMS], 2015; American Academy of Orthopedic Surgeons [AAOS], 2015; Mehlman, 2015; Romana, et al., 2012). As stated, chiropractic care has been utilized for the treatment of idiopathic scoliosis however scientific evidence is limited and the efficacy of manual therapy for correcting the scoliotic curve or progression of the curve has not been established in the peer-reviewed published scientific literature. Chiropractic manipulation may be used to improve joint mobility and relieve pain associated with scoliosis.

Spinal Manipulation for the Treatment of Non-Musculoskeletal Conditions and Related Disorders
Spinal manipulation is considered experimental, investigational, or unproven for the treatment of non-musculoskeletal conditions and related disorders including, but not limited to:

- Asthma
- ADHD
- Autism spectrum disorders
- Dysmenorrhea
- Hypertension
- Infantile colic
- Nocturnal enuresis
- Otitis media

The set of conditions above represents those non-musculoskeletal conditions which have been found in the literature relative to spinal manipulation either through RCTs, systematic reviews, or both. Evidence is insufficient to support use of spinal manipulation for treatment of these conditions (Alcantara et al., 2011; Hondras et al., 2011; Kaminskyj et al., 2014; Gleberzon et al., 2012; Clar et al., 2014; Karpouzis et al., 2010; Ferrance and Miller, 2010; Proctor, et al., 2006; Bakris, 2007; Mangum et al., 2012; Dobson et al., 2012; Huang et al., 2011; Pohlman, Holton-Brown, 2012; Driehuis et al., 2019; Côté et al., 2021; Goertz et al., 2021). The long-term safety and effectiveness of the use of chiropractic management and manual therapies in the treatment of non-neuromusculoskeletal conditions, including but not limited to hypertension, obesity, rheumatoid arthritis, smoking, asthma, colic and otitis media have not been proven in the medical literature through long-term, randomized, controlled clinical trials.

Manipulation/Mobilization for Upper and Lower Extremities

The literature is insufficient to conclude that the use of upper extremity manipulation/mobilization for epicondylitis/epicondylalgia and carpal tunnel syndrome confers an added health benefit or improvement when included as part of a multimodal treatment for these conditions. There is very little research on manipulation and its effect in elbow and wrist disorders. Additional clinical trials are required to determine the effectiveness of upper extremity manipulation/mobilization for the treatment of these conditions (Brantingham et al., 2011; Clar et al., 2014; Hoogvliet et al., 2013; Roll and Hardison, 2017; Lucado et al., 2018; Westad et al., 2019; Savva et al., 2021).

The literature is insufficient to conclude that the use of lower extremity manipulation/mobilization for the treatment of hip osteoarthritis, knee osteoarthritis, and plantar fasciitis confers an added health benefit or improvement when included as part of a multimodal treatment for these conditions. Additional clinical trials are required to determine the effectiveness of lower extremity manipulation/mobilization for the treatment of these conditions (Bronfert et al., 2010; Brantingham et al., 2012; Bennell et al., 2015; Beselga et al., 2016; Courtney et al., 2016; Durall et al., 2010; Westad et al., 2019; Welleslassie et al., 2021; Karaborklu Argut et al., 2021; Kashif et al., 2021). With regard to other conditions involving the ankle/foot, there has been very limited research on manipulation for plantar fasciitis, metatarsalgia, hallux rigidus, and hallux valgus/bunion.

Specific Treatments Considered Experimental, Investigational, or Unproven:

Dry hydrotherapy
Dry hydrotherapy, also referred to as aquamassage, water massage, or hydromassage, is a treatment that incorporates water with the intent of providing therapeutic massage. The treatment is generally provided in chiropractor or physical therapy offices. There are several dry hydrotherapy devices available that provide this treatment, including the following:

- Aqua Massage® (AMI Inc., Mystic, CT)
- AquaMED® (JTL Enterprises, Inc., Clearwater, FL)
- H2OMassage System™ (H2OMassage Systems, Winnipeg, MB, Canada)
- Hydrotherapy Tables (Sidmar Manufacturing, Inc., Princeton, MN)

Proponents of dry hydrotherapy maintain that it can be used in lieu of certain conventional physical medicine therapeutic modalities and procedures, such as heat packs, wet hydrotherapy, massage, and soft tissue manipulation. The assertions that have been made by manufacturers of this device at their websites have not yet been proven. No published studies or information regarding dry hydrotherapy devices or dry hydrotherapy treatment were identified in the peer-reviewed scientific literature. In the absence of peer- reviewed literature demonstrating the effectiveness of dry hydrotherapy and in the absence of comparison to currently accepted treatment modalities, no definitive conclusions can be drawn regarding the clinical benefits of this treatment.

Non-invasive Interactive Neurostimulation (e.g. InterX®)
Non-invasive, Interactive Neurostimulation (NIN) (e.g. InterX®) is used for the treatment of acute and chronic pain using high amplitude, high density stimulation to the cutaneous nerves, activating the natural pain relieving mechanisms of the body (segmental and descending inhibition). There is a lack of evidence to support this form of modality.

Microcurrent Electrical Nerve Stimulation (MENS)
There is insufficient evidence in the published peer-reviewed scientific literature to support the safety and effectiveness of MENS (Rajpurohit et al., 2010; Zuim et al., 2006; Nair et al., 2018; Iijima and Takahashi, 2021).

H-WAVE®
H-wave stimulation is a form of electrical stimulation that differs from other forms of electrical stimulation, such as transcutaneous electrical nerve stimulation (TENS), in terms of its wave form. There is insufficient evidence in the published peer reviewed scientific literature to support the safety and effectiveness of the H-WAVE® electrical stimulators (Blum et al., 2008; Williamson et al. 2021).

Taping/Elastic therapeutic tape (e.g., Kinesio™ tape, Spidertech™ tape)
Elastic therapeutic tape, also known as kinesiology tape, differs from traditional white athletic tape in the sense that it is elastic and can be stretched to 140% of its original length before being applied to the skin.

Elastic tape is available in various lengths or pre-cut. There are several types of elastic therapeutic tape available including:

- Kinesio™ tape (Kinesio Taping, LLC. Albuquerque, NM)
- SpiderTech™ tape (SpiderTech Inc., Toronto, Ontario)
- KT TAPE/KT TAPE PRO™ (LUMOS INC., Lindon, UT)

The clinical value of elastic therapeutic taping (i.e., Kinesio taping) or rigid therapeutic taping (i.e., McConnell) for back pain, radicular pain syndromes, and other back-related conditions has not been established as there is insufficient evidence in the peer-reviewed literature (Chou et al., 2016).

The effectiveness of elastic therapeutic taping (i.e. Kinesio taping) or rigid therapeutic taping (i.e. McConnell) for all conditions such as lower extremity spasticity, meralgia paresthetica, post-operative subacromial decompression, wrist injury, performance enhancement and prevention of ankle sprains has not been established as the evidence is insufficient in the peer-reviewed literature (Added et al., 2016; Al-Shareef et al., 2016; Csapo et al., 2014; Kalron et al., 2013; Lim et al., 2015; Mostafavifa et al., 2012; Nelson 2016; Parreira et al., 2014; Williams et al., 2012; Luz Júnior et al., 2019; Lin et al., 2020; Li et al., 2020; Martonick et al., 2020; Cupler et al., 2020; Lim and Tay 2015; Montalvo et al. 2014; Hedden et al., 2020; Nunes et al., 2021; Pinheiro et al., 2021; Luo and Li, 2021; Jassi et al., 2021; de Oliveira et al., 2021; Araya-Quintanilla et al., 2021; de Sire et al., 2021; Deng et al., 2021).

The following uses of therapeutic taping are professionally recognized and safe; however, additional studies are needed before the clinical effectiveness can be established. Use of elastic or rigid taping techniques as part of comprehensive treatment program may be clinically appropriate for the following:

- Elastic therapeutic tape (e.g., Kinesio tape, Spidertech tape) in the treatment or management of lymphedema
- Rigid therapeutic taping for pain reduction in patellofemoral pain syndrome
- Rigid therapeutic taping of the shoulder in patients with hemiplegia

The use of rigid taping or elastic taping for rehabilitation of orthopedic or neurologic conditions is not intended as a sole treatment or as a separately billable procedure, but rather is part of a broad treatment program that includes exercise, manual therapy and/or neuromuscular re-education (NMR) and is inclusive in these procedures. Strapping codes are not allowed for application of therapeutic taping.

Dry Needling

Research suggests that dry needling may improve pain control, reduce muscle tension, normalize biochemical and electrical dysfunction of motor endplates, and may facilitate an accelerated return to active rehabilitation [American Association of Orthopaedic Manual Physical Therapists (AAOMPT) position statement, 2010; APTA Resource Paper, 2012]. However further high quality research is needed to confirm findings for specific conditions and to relate improvements in pain and muscle quality to objective functional measures (Boyles et al., 2015; Cerezo-Téllez et al., 2016; Cotchett et al., 2010; Dommerholt et al., 2016; Dıraçoğlu et al., 2012; Gerber et al., 2016; Kalichman et al., 2010; Kietrys et al., 2013; Lui et al., 2015; Rodríguez-Mansilla et al., 2016; Tekin et al., 2014; Tough et al., 2009; Gattie et al., 2017; Espí-López et al., 2017; Lui et al., 2017; Liu et al., 2018; Sánchez Romero et al., 2020; Navarro-Santana et al., 2020; Pourahmadi et al., 2021; Navarro-Santana et al., 2021; Gattie et al., 2021; Bier et al., 2018; Sánchez-Infante et al., 2021; Jayaseelan et al., 2021; Llurda-Almuzara et al., 2021; Al-Moraissi et al., 2020; Valencia-Chulián et al., 2020; Sousa Filho et al., 2021; Wang et al., 2022; Mousavi-Khatir et al., 2022; Khan et al., 2021; Kamonseki et al., 2022).

Vertebral Axial Decompression Therapy and Devices

Vertebral axial decompression therapy, also referred to as mechanized spinal distraction therapy, has been proposed as a nonsurgical treatment for back pain. Vertebral axial decompression devices are typically used in a clinic or rehabilitation setting and include the VAX-D (VAX-D Medical Technologies LLC, Oldsmar, FL), DRS system (Professional Distribution Systems, Inc., Boca Raton, FL), DRX2000 (Axiom Worldwide, Inc., Tampa, FL) and other FDA-approved devices. The published scientific data is insufficient to validate improved clinical outcomes (e.g., reduction of back pain, improved functioning) associated with vertebral axial decompression therapy. While several technology assessments have been published, effectiveness of the various devices have

not been proven when compared to standard equipment or testing (Macario and Pergolizzi 2006, 2008; Daniel 2007; Beattie et al., 2008; Schimmel et al.,2009; Apfel et al., 2010; Kang et al., 2016; Demirel et al., 2017).

MedX lumbar/cervical machines/Cybex back system/Biodex
MedX is comprehensive rehabilitation program that incorporates the physician-directed team approach for the treatment of chronic neck and back pain through specific spinal extension strengthening. MedX machines are specifically designed to provide a means of isolating, safely testing and directly strengthening the muscles of the low back and neck. The evidence is not sufficient to confirm that adding MedX to a formal physical therapy program is beneficial. Nor does the literature support that MedX is a superior form of exercise over other forms of exercise for chronic low back pain (Steele et al., 2013; Steele et al., 2015; Steele et al., 2017; Bruce-Low et al., 2012; Saragiotto et al., 2016; Chou et al., 2016; Owens et al., 2020). There is no evidence to suggest that use of the Biodex or Cybex systems for back rehabilitation are superior to other forms of exercise. This equipment can be used as part of a multi-modal treatment program that includes other forms of exercise as well.

Thermography
Thermography, specifically the use of diagnostic infrared equipment requiring a special climate controlled room under controlled conditions, is considered medically necessary for certain conditions including complex regional pain syndromes, carpal tunnel syndrome, disc herniation, and radiculopathy. Diagnostic thermography, when performed using a hand held contact (e.g., liquid crystal) or thermocouple (e.g., neurocalometer or Nervoscope) devices, is considered experimental and investigational and not medically necessary for any condition. Sanchis-Sánchez et al. (2014) completed a systematic review and meta-analysis on infrared thermal imaging in the diagnosis of musculoskeletal injuries. The authors concluded there is a lack of support for the usefulness of infrared thermal imaging in musculoskeletal injury diagnosis. Dibai-Filho and Guirro (2015) did a critical review of the literature on the evaluation of myofascial trigger points using infrared thermography. The authors concluded that currently, there are few studies evaluating the accuracy and reliability of infrared thermography for the diagnosis and assessment of myofascial trigger points.

Surface Electromyography (SEMG)
Surface Electromyography (SEMG) is considered experimental and investigational for diagnostic purposes of any condition. There is insufficient evidence in the peer-reviewed literature to establish its clinical utility and effectiveness (Mohseni et al., 2014; Ng et al., 2002; Triano et al., 2013; Danneels et al., 2001; Ahern et al., 1988; Ambroz et al., 2000; Alexiev et al., 1994; Lariviere et al., 2002; Geisser et al., 2005; Hu et al., 2014; Haug et al., 1996).

Laboratory Testing: Although there are several laboratory tests that may be incorporated into an evaluation of a patient's musculoskeletal complaint (e.g. Arthritic panel, ESR, etc.); conservative management of musculoskeletal and related conditions does not routinely require the use of laboratory testing.

Diagnostic Imaging:
According to the American College of Radiology, radiography is a proven and useful modality that uses differences in X-ray attenuation to evaluate human anatomy and pathology. The goal is to establish the presence or absence and nature of disease by demonstrating normal anatomy or the effects of the disease process on anatomical structures. The study should be performed with the minimal radiation dose necessary to achieve a diagnostic study.

While exposure to use of ionizing radiation for diagnostic purposes poses both risks and benefits, its use should be tailored as much as feasible to situations where it is capable of producing diagnostically or therapeutically significant information for clinicians. Scientific evidence clearly supports the medical necessity of radiographic examination when the information received from the exam is essential to ascertain the safety and appropriateness of planned treatment interventions. According to the American College of Radiology, there are many indications for radiography that relate to the patient's clinical history, the disease processes, and the anatomic areas of concern. There should be a sufficient clinical indication to warrant performance of a study, and a reasonable anticipation that the results of the radiograph, normal or abnormal, will influence the treatment course of the patient. This guideline is designed to assist you in the imaging decision process.

Plain film radiography is the most widely used skeletal imaging method. The primary value of plain films is to show pathologies of bone or joint structures, especially if there is a question of a possible fracture, demineralization, or other bone-weakening disease. A normal x-ray does not always rule out skeletal pathology.

Pathology can only be ruled out through the appropriate assessment of red flags identified through careful history and physical examination combined with appropriate diagnostic triage.

Recent literature reviews conclude there is insufficient evidence for using x-rays for biomechanical analysis, including but not limited to the detection and characterization of subluxation(s), except for scoliosis evaluation or intersegmental instability when correlated with evidence obtained through careful history and physical examination.

Plain film radiographs should not be used as a screening procedure without clinical indications. If prior imaging of the area in question has been performed at another facility, all reasonable attempts should be made to obtain the results of those studies prior to considering further studies.

Diagnostic ultrasound for spinal/paraspinal evaluation (e.g., facet joints and capsules, nerve and fascial edema, and other subtle paraspinous abnormalities) is considered experimental and investigational. There is insufficient evidence in the peer-reviewed medical literature establishing the value of nonoperative spinal/paraspinal ultrasound in adults. The Official Statement of the American Institute of Ultrasound in Medicine (AIUM) as noted in a document titled “Nonoperative Spinal/Paraspinal Ultrasound in Adults” (2019) states that “there is insufficient evidence in the peer-reviewed medical literature establishing the value of nonoperative spinal/paraspinal ultrasound in adults for diagnostic evaluations of conditions involving the intervertebral disks, facet joints and capsules, and central nerves.” Therefore, the AIUM states that “at this time, the use of ultrasound in diagnostic evaluations, screening, or monitoring of therapy for these conditions has no proven clinical utility and should be considered investigational.

Other special studies that may be used as part of a conservative treatment plan include nerve conduction studies, electromyography studies, and other imaging techniques. The clinical utility of some laboratory testing, diagnostic tools, and/or rehabilitative devices, has not been proven in the medical literature through well-designed clinical trials and the published scientific evidence is insufficient to show improvement in net health outcomes when these services are performed

Digital Postural Analysis: Posture analysis is a method by which deviation in posture may be determined, theoretically identifying areas that are likely to cause or are causing pain. Various systems may be utilized to conduct posture analysis and include software systems for analyzing digital/video images. Following the procedure, a report is produced identifying posture deviations. Postural analysis may be used to document posture before and after treatment sessions, to educate individuals regarding deviations and causes of pain and to customize and monitor treatment plans. However, there is lack of evidence in the peer-reviewed published scientific literature evaluating this technology and conclusions cannot be drawn regarding the added benefit of digital postural analysis and how this technology affects treatment plans to improve clinical outcomes. In addition, postural analysis is considered an evaluation procedure that would be integral to an examination (E/M service) or a brief evaluation contained within the work value of the chiropractic manipulative treatment CPT code.

Digital Radiographic Mensuration: Digital radiographic mensuration, also referred to as radiographic digitization, or computer-aided radiographic mensuration analysis (CRMA), refers to a computerized analysis of osseous geometric relationships, often employed as part of postural analysis. Mensuration is a term that refers to chiropractic line measurements, with or without computer digitalization and may be used to assess subluxation and alignment. Historically, chiropractic line measurements were drawn manually on radiographs with the use of rulers, pencils and protractors. Manual marking techniques may lead to error and more recently, computer aided or digitalized mensuration has been utilized, theoretically providing results more rapidly and with less variance. Although published data comparing digital radiograph mensuration to manual methods is limited, a few results for reliability testing have been published and lend some support to concurrent validity when compared to manual methods (Troyanovich, et al., 2000). However, well-designed clinical trials supporting efficacy are lacking in the medical literature and there is insufficient evidence to support that the use of this technology adds any benefit or improvement of health outcomes when compared to standard chiropractic techniques. In addition, such analysis is included in the professional component of the radiology CPT code.

Providers of Chiropractic Services
The services are delivered by a qualified provider of chiropractic services acting within the scope of their license as regulated by the Federal and State governments. Generally, only those healthcare practitioners who hold an

active license, certification, or registration with the applicable state board or agency may provide services under the direction and supervision of a chiropractor (e.g. licensed massage therapist, physical therapist) but the scope and extent of such services, when provided as part of a chiropractic treatment plan and billed by the chiropractor, may be regulated by the applicable state board responsible for licensure of the chiropractor. Benefits for services provided by these ancillary healthcare providers may also be dependent upon the member's benefit contract language.

Aides, athletic trainers, exercise physiologists, life skills trainers, and rehabilitation technicians do not meet the definition of a qualified practitioner regardless of the level of supervision. Aides and other nonqualified personnel as listed above are limited to non-skilled services such as preparing the individual, treatment area, equipment, or supplies; assisting a qualified therapist or assistant; and transporting individuals. They may not provide any direct treatments, modalities, or procedures.

Coding Information

Note: 1) This list of codes may not be all-inclusive.
2) Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement.

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

CPT®* Codes	Description
97010	Application of a modality to 1 or more areas; hot or cold packs
97012	Application of a modality to 1 or more areas; traction, mechanical
97014	Application of a modality to 1 or more areas; electrical stimulation (unattended)
97018	Application of a modality to 1 or more areas; paraffin bath
97022	Application of a modality to 1 or more areas; whirlpool
97024	Application of a modality to 1 or more areas; diathermy (eg, microwave)
97028	Application of a modality to 1 or more areas; ultraviolet
97032	Application of a modality to 1 or more areas; electrical stimulation (manual), each 15 minutes
97033	Application of a modality to 1 or more areas; iontophoresis, each 15 minutes
97034	Application of a modality to 1 or more areas; contrast baths, each 15 minutes
97035	Application of a modality to 1 or more areas; ultrasound, each 15 minutes
97036	Application of a modality to 1 or more areas; Hubbard tank, each 15 minutes
97110	Therapeutic procedure, 1 or more areas, each 15 minutes; therapeutic exercises to develop strength and endurance, range of motion and flexibility
97112	Therapeutic procedure, 1 or more areas, each 15 minutes; neuromuscular reeducation of movement, balance, coordination, kinesthetic sense, posture, and/or proprioception for sitting and/or standing activities
97113	Therapeutic procedure, 1 or more areas, each 15 minutes; aquatic therapy with therapeutic exercises
97116	Therapeutic procedure, 1 or more areas, each 15 minutes; gait training (includes stair climbing)
97124	Therapeutic procedure, 1 or more areas, each 15 minutes; massage, including effleurage, petrissage and/or tapotement (stroking, compression, percussion)
97140	Manual therapy techniques (eg, mobilization/ manipulation, manual lymphatic drainage, manual traction), 1 or more regions, each 15 minutes
97150	Therapeutic procedure(s), group (2 or more individuals)
97530	Therapeutic activities, direct (one-on-one) patient contact (use of dynamic activities to improve functional performance), each 15 minutes
98940	Chiropractic manipulative treatment (CMT); spinal, 1-2 regions
98941	Chiropractic manipulative treatment (CMT); spinal, 3-4 regions
98942	Chiropractic manipulative treatment (CMT); spinal, 5 regions
98943	Chiropractic manipulative treatment (CMT); extraspinal, 1 or more regions

Considered Not Medically Necessary:

CPT®* Codes	Description
97016	Application of a modality to 1 or more areas; vasopneumatic devices
97026	Application of a modality to 1 or more areas; infrared

Considered Nonmedical, Educational or Training in Nature and Not Medically Necessary:

CPT®* Codes	Description
97169	Athletic training evaluation, low complexity, requiring these components: A history and physical activity profile with no comorbidities that affect physical activity; An examination of affected body area and other symptomatic or related systems addressing 1-2 elements from any of the following: body structures, physical activity, and/or participation deficiencies; and Clinical decision making of low complexity using standardized patient assessment instrument and/or measurable assessment of functional outcome. Typically, 15 minutes are spent face-to-face with the patient and/or family.
97170	Athletic training evaluation, moderate complexity, requiring these components: A medical history and physical activity profile with 1-2 comorbidities that affect physical activity; An examination of affected body area and other symptomatic or related systems addressing a total of 3 or more elements from any of the following: body structures, physical activity, and/or participation deficiencies; and Clinical decision making of moderate complexity using standardized patient assessment instrument and/or measurable assessment of functional outcome. Typically, 30 minutes are spent face-to-face with the patient and/or family.
97171	Athletic training evaluation, high complexity, requiring these components: A medical history and physical activity profile, with 3 or more comorbidities that affect physical activity; A comprehensive examination of body systems using standardized tests and measures addressing a total of 4 or more elements from any of the following: body structures, physical activity, and/or participation deficiencies; Clinical presentation with unstable and unpredictable characteristics; and Clinical decision making of high complexity using standardized patient assessment instrument and/or measurable assessment of functional outcome. Typically, 45 minutes are spent face-to-face with the patient and/or family.
97172	Re-evaluation of athletic training established plan of care requiring these components: An assessment of patient's current functional status when there is a documented change; and A revised plan of care using a standardized patient assessment instrument and/or measurable assessment of functional outcome with an update in management options, goals, and interventions. Typically, 20 minutes are spent face-to-face with the patient and/or family.
97537	Community/work reintegration training (eg, shopping, transportation, money management, avocational activities and/or work environment/modification analysis, work task analysis, use of assistive technology device/adaptive equipment), direct one-on-one contact, each 15 minutes
97545	Work hardening/conditioning; initial 2 hours
97546	Work hardening/conditioning; each additional hour (List separately in addition to code for primary procedure)

HCPCS Codes	Description
S8990	Physical or manipulative therapy performed for maintenance rather than restoration
S9117	Back school, per visit

Considered Experimental/ Investigational/ Unproven:

CPT®* Codes	Description
20560	Needle insertion(s) without injection(s); 1 or 2 muscle(s)
20561	Needle insertion(s) without injection(s); 3 or more muscles
76499†	Unlisted diagnostic radiographic procedure

76800	Ultrasound, spinal canal and contents

†Note: Considered Experimental/ Investigational/ Unproven when used to represent radiograph digital mensuration, radiographic digitization and digital postural analysis.

HCPCS Codes	Description
S3900	Surface electromyography (EMG)
S9090	Vertebral axial decompression, per session

Considered Experimental/Investigational/Unproven when used to report any other treatment listed as EIU in the policy statement that does not have an assigned code:

CPT®* Codes	Description
97039	Unlisted modality (specify type and time if constant attendance)
97799	Unlisted physical medicine/rehabilitation service or procedure

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References

1. Activator Methods, International Ltd. Activator Methods. © Copyright 1995-2014 Activator Methods. Accessed October 23, 2022. Available at URL address: https://www.activator.com/

2. Added MA, Costa LO, de Freitas DG, Fukuda TY, Monteiro RL, Salomão EC, de Medeiros 2 FC, Costa Lda C. Kinesio Taping Does Not Provide Additional Benefits in Patients With Chronic Low Back Pain Who Receive Exercise and Manual Therapy: A Randomized Controlled Trial. J Orthop Sports Phys Ther. 2016 Jul; 46(7):506-13.

3. Agency for Healthcare Research and Quality. Multidisciplinary Postacute Rehabilitation for Moderate to Severe Traumatic Brain Injury in Adults. Effective Health Care Program. Comparative Effectiveness Review, 2012;72. Accessed October 23, 2022. Available at URL address: https://effectivehealthcare.ahrq.gov/topics/traumatic-brain-injury-rehabilitation/research

4. Agency for Healthcare Research and Quality (AHRQ) (previously Agency for Healthcare Policy and Research [AHCPR]). Chiropractic in the United States: training, practice and research. Publication No. 98-N002. 1997 Dec. Accessed October 23, 2022. Available at URL address: https://www.chiroweb.com/archives/ahcpr/uschiros.htm

5. Airaksinen O, Brox JI, Cedraschi C, Hildebrandt J, Klaber-Moffett J, Kovacs F, Mannion AF, Reis S, Staal JB, Ursin H, Zanoli G; COST B13 Working Group on Guidelines for Chronic Low Back Pain. Chapter 4. European guidelines for the management of chronic nonspecific low back pain. Eur Spine J. 2006 Mar;15 Suppl 2:S192-300.

6. Alcantara J, Alcantara JD, Alcantara J. The chiropractic care of infants with colic: a systematic review of the literature. Explore. 2011 May;7(3):168–74.

7. Al-Shareef AT, Omar MT, Ibrahim AH. Effect of Kinesio Taping on Pain and Functional Disability in Chronic Nonspecific Low Back Pain: A Randomized Clinical Trial. Spine (Phila Pa 1976). 2016 Jul 15; 41(14):E821-8.

8. Al-Moraissi EA, Alradom J, Aladashi O, Goddard G, Christidis N. Needling therapies in the management of myofascial pain of the masticatory muscles: A network meta-analysis of randomised clinical trials. J Oral Rehabil. 2020 Jul;47(7):910-922.

9. American Association of Electrodiagnostic Medicine. Technology review: the use of surface EMG in the diagnosis and treatment of nerve and muscle disorders. 2008. Accessed October 23,2022. Available at URL address: http://www.aanem.org/getmedia/5397eea1-3de0-469d-a293-24bd7e2f1050/tech_rvw_surface_emg.PDF.aspx

10. American Academy of Orthopedic Surgeons. Scoliosis. Last reviewed: April 2021. Accessed October 23, 2022. Available at URL address: http://orthoinfo.aaos.org/topic.cfm?topic=A00353

11. American Academy of Orthopedic Surgeons. Nonsurgical Treatment Options for Scoliosis. Last Reviewed: Sept 2019. Accessed October 23, 2022. Available at URL address: http://www.orthoinfo.org/topic.cfm?topic=A00636

12. American College of Occupational and Environmental Medicine; Glass LS, editor. Occupational medicine practice guidelines: evaluation and management of common health problems and functional recovery in workers. Pain, suffering and restoration of function. 2nd ed. Chapter 6.1997.

13. American College of Occupational and Environmental Medicine; Glass LS, editor. Occupational medicine practice guidelines: evaluation and management of common health problems and functional recovery in workers. Low back complaints. 2nd ed. Chapter 12.1997.

14. American College of Occupational and Environmental Medicine. Neck complaints. In: ACOEM Practice Guidelines Committee. Occupational medicine practice guidelines: evaluation and management of common health problems and functional recovery in workers. 2nd ed. 1997. p.11-1 to 11-17.

15. American College of Radiology (ACR). ACR Practice Guideline for Performing and Interpreting Diagnostic Ultrasound Examinations. Effective 10/01/2006. Revised 2017 (Resolution 32). Accessed October 23, 2022. Available at URL address: http://www.acr.org/Quality-Safety/Standards-Guidelines

16. American Institute of Ultrasound Medicine (AIUM). AIUM Practice Guideline for the Performance of Musculoskeletal Ultrasound Examination. © 2017 by the American Institute of Ultrasound Medicine. Effective October 1, 2007, revised 2017. Accessed October 23, 2022. Available at URL address: http://www.aium.org/resources/guidelines.aspx

17. American Institute of Ultrasound Medicine (AIUM).Nonoperative spinal/paraspinal ultrasound in adults. 11/2/2019. Accessed October 23, 2022. Available at URL address: http://www.aium.org/resources/statements.aspx

18. American Medical Association (AMA). (2018). Current Procedural Terminology (CPT) Current year (rev. ed.). Chicago: AMA.

19. Apfel CC, Cakmakkaya OS, Martin W, Richmond C, Macario A, George E, et al. Restoration of disk height through non-surgical spinal decompression is associated with decreased discogenic low back pain: a retrospective cohort study. BMC Musculoskelet Disord. 2010 Jul 8;11:155.

20. Aqua Massage [product description]. AMI Inc. Accessed October 23, 2022. Available at URL address: http://www.aquamassage.com/

21. AquaMED Dry Hydrotherapy. JTL Enterprises, Inc. Accessed October 23, 2022. Available at URL http://www.hydromassage.com/

22. Araya-Quintanilla F, Gutiérrez-Espinoza H, Sepúlveda-Loyola W, Probst V, Ramírez-Vélez R, Álvarez-Bueno C. Effectiveness of kinesiotaping in patients with subacromial impingement syndrome: A systematic review with meta-analysis [published online ahead of print, 2021 Oct 16]. Scand J Med Sci Sports. 2021;10.1111/sms.14084.

23. Beattie PF, Nelson RM, Michener LA, Cammarata J, Donley J. Outcomes after a prone lumbar traction protocol for patients with activity-limiting low back pain: a prospective case series study. Arch Phys Med Rehabil. 2008 Feb;89(2):269-74.

24. Bennell KL, Buchbinder R, Hinman RS. Physical therapies in the management of osteoarthritis: current state of the evidence. Curr Opin Rheumatol. 2015;27(3):304-16 11.

25. Beselga C, Neto F, Alburquerque-Sendín F, Hall T, Oliveira-Campelo N. Immediate effects of hip mobilization with movement in patients with hip osteoarthritis: A randomised controlled trial. Man Ther. 2016 Apr;22:80-5.

26. Bier JD, Scholten-Peeters WGM, Staal JB, Pool J, van Tulder MW, Beekman E, Knoop J, Meerhoff G, Verhagen AP. Clinical Practice Guideline for Physical Therapy Assessment and Treatment in Patients With Nonspecific Neck Pain. Phys Ther. 2018 Mar 1;98(3):162-171.

27. Boyles R, Fowler R, Ramsey D, Burrows E. Effectiveness of trigger point dry needling for multiple body regions: a systematic review. J Man Manip Ther. 2015 Dec;23(5):276-93.

28. Braddock EJ, Greenlee J, Hammer RE, Johnson SF, Martello MJ, O'Connell MR, Rinzler 9 R, Snider M, Swanson MR, Tain L, Walsh G, Walsh G. Manual medicine guidelines for musculoskeletal injuries. Sonora (CA): Academy for Chiropractic Education; 2013 Dec 1. 70 p. Accessed October 23, 2022. Available at URL address: https://www.guidelinecentral.com/summaries/manual-medicine-guidelines-for-musculoskeletal-injuries/#section-society

29. Brantingham JW, Cassa TK, Bonnefin D, Jensen M, Globe G, Hicks M, Korporaal C. Manipulative therapy for shoulder pain and disorders: expansion of a systematic review. J Manipulative Physiol Ther 2011;34:314-346.

30. Brantingham JW, Bonnefin D, Perle SM, Cassa TK, Globe G, Pribicevic M, Hicks M, 23 Korporaal C. Manipulative therapy for lower extremity conditions: update of a literature review. J Manipulative Physiol Ther 2012;35:127-166.

31. Briem, K., Eythörsdöttir, H., Magnúsdóttir, R. G., Pálmarsson, R., Rúnarsdöttir, T, & Sveinsson, T. (2011). Effects of kinesio tape compared with non-elastic sports tape and the untaped ankle during a sudden inversion perturbation in male athletes. Journal of Orthopaedic and Sports Physical Therapy, 41(5), 328-335.

32. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Effectiveness of manual therapies: the UK evidence report.Chiropr Osteopat. 2010 Feb 25;18:3.

33. Bronfort, G., Haas, M., Evans, R. I., & Bouter, L. M. (2004). Efficacy of spinal manipulation and mobilization for low back pain and neck pain: A systematic review and best evidence synthesis. The Spine Journal, 4(3), 335-336.

34. Bronfort, G., Haas, M., Evans, R. I., Kawchuk, G., & Dagenais, S. (2008). Evidence-informed managment of chronic low back pain with spinal manipulation and mobilization. The Spine Journal, 8(1), 213-225.

35. Bryans R, Descarreaux M, Duranleau M, Marcoux H, Potter B, Ruegg R, Shaw L, Watkin R, White E. Evidence-based guidelines for the chiropractic treatment of adults with headache. J Manipulative Physiol Ther. 2011 Jun;34(5):274-89.

36. Bryans R, Decina P, Descarreaux M, Duranleau M, Marcoux H, Potter B, et al. Evidence-based guidelines for the chiropractic treatment of adults with neck pain. J Manipulative Physiol Ther. 2014 Jan;37(1):42-63.

37. Bruce-Low S, Smith D, Burnet S, Fisher J, Bissell G, Webster L. One lumbar extension training session per week is sufficient for strength gains and reductions in pain in patients with chronic low back pain ergonomics. Ergonomics. 2012;55(4):500-7.

38. Butts R, Dunning J, Pavkovich R, Mettille J, Mourad F. Conservative management of temporomandibular dysfunction: A literature review with implications for clinical practice guidelines (Narrative review part 2). J Bodyw Mov Ther. 2017 Jul;21(3):541-548.

39. Callaghan MJ, Selfe J. Patellar taping for patellofemoral pain syndrome in adults. Cochrane Database Syst Rev. 2012 Apr 18; 4:CD006717.

40. Campolo M, Babu J, Dmochowska K, Scariah S, Varughese J. A comparison of two taping techniques (kinesio and mcconnell) and their effect on anterior knee pain during functional activities. Int J Sports Phys Ther. 2013 Apr; 8(2):105-10.

41. Centers for Medicare & Medicaid Services (CMS). National Coverage Determination 27 160.16. Vertebral axial decompression (VAX-D). Effective date April 15, 1997. Accessed October 23, 2022. Available at URL address: http://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?NCDId=124&ncdver=1&bc=BAABAAAAAAAA&

42. Centers for Medicare & Medicaid Services. Medical Coverage Database. Physical and Occupational Therapy Local Coverage Determinations. Retrieved on October 23, 2022 from https://www.cms.gov/medicare-coverage-database/search-results.aspx?keyword=physical+therapy&keywordType=starts&areaId=all&docType=NCA,CAL,NCD,MEDCAC,TA,MCD,6,3,5,1,F,P&contractOption=all

43. Centers for Medicare and Medicaid Services. Local Coverage Article: CHIROPRACTIC Services – Medical Policy Article (A57889)). Accessed on October 23, 2022. Available at URL address: https://www.cms.gov/medicare-coverage-database/details/article-details.aspx?articleid=57889&ver=3&keyword=chiropractic&keywordType=starts&areaId=all&docType=NCA,CAL,NCD,MEDCAC,TA,MCD,6,3,5,1,F,P&contractOption=all&sortBy=relevance&bc=AAAAAAQAAAAA&KeyWordLookUp=Doc&KeyWordSearchType=Exact

44. Cerezo-Téllez E, Torres-Lacomba M, Fuentes-Gallardo I, Perez-Muñoz M, Mayoral-Del-Moral O, Lluch-Girbés E, Prieto-Valiente L, Falla D. Effectiveness of dry needling for chronic nonspecific neck pain: a randomized, single-blinded, clinical trial. Pain. 2016 Sep;157(9):1905-17.

45. Cervical and thoracic spine disorders. In: Hegmann KT, editor(s). Occupational medicine practice guidelines. Evaluation and management of common health problems and functional recovery in workers. 3rd ed. Elk Grove Village (IL): American College of Occupational and Environmental Medicine (ACOEM); 2011. p. 1-332.

46. Cherkin, D. C., Sherman, K. J., Deyo, R. A., & Shekell, P. G. (2003). A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain. Annals of Internal Medicine, 138(11), 898-38 906.

47. Chang WD, Chen FC, Lee CL, Lin HY, Lai PT. Effects of Kinesio Taping versus McConnell Taping for Patellofemoral Pain Syndrome: A Systematic Review and Meta-Analysis. Evid Based Complement Alternat Med. 2015; 2015:471208.

48. Chou R, Deyo R, Friedly J, Skelly A, Hashimoto R, Weimer M, Fu R, Dana T, Kraegel P, Griffin J, Grusing S, Brodt E. Noninvasive Treatments for Low Back Pain. Comparative Effectiveness Review No. 169. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 290-2012-00014-I.) AHRQ Publication No. 16-EHC004-EF. Rockville, MD: Agency for Healthcare Research and Quality; February 2016.

49. Chou R, Huffman LH; American Pain Society; American College of Physicians. Nonpharmacologic therapies for acute and chronic low back pain: a review of the evidence for an American Pain Society/American College of Physicians clinical practice guideline. Ann Intern Med. 2007a Oct 2;147(7):492-504.

50. Chou R, Qaseem A, Snow V, Casey D, Cross JT Jr, Shekelle P, Owens DK; Clinical Efficacy Assessment Subcommittee of the American College of Physicians; American College of Physicians; American Pain Society Low Back Pain Guidelines Panel. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007b Oct 2;147(7):478-91.

51. Chou R, Wagner J, Ahmed AY, et al. Treatments for Acute Pain: A Systematic Review. Rockville (MD): Agency for Healthcare Research and Quality (US); December 2020.

52. Chou R and Hoyt Huffman LH. Nonpharmacologic therapies for acute and chronic low back pain: A review of the evidence for an American Pain Society/American College of Physicians Clinical Practice Guideline. Annals of Internal Medicine. 2007;147(7):492-504.

53. Clar C, Tsertsvadze A, Court R, Hundt GL, Clarke A, Sutcliffe P. Clinical effectiveness of manual therapy for the management of musculoskeletal and non-musculoskeletal conditions: systematic review and update of UK evidence report. Chiropr Man Therap. 2014 Mar 28;22(1):12.

54. Cotchett MP, Landorf KB, Munteanu SE. Effectiveness of dry needling and injections of myofascial trigger points associated with plantar heel pain: a systematic review. Foot Ankle Res. 2010;3:18.

55. Côté P, Hartvigsen J, Axén I, et al. The global summit on the efficacy and effectiveness of spinal manipulative therapy for the prevention and treatment of non-musculoskeletal disorders: a systematic review of the literature [published correction appears in Chiropr Man Therap. 2021 Mar 8;29(1):11]. Chiropr Man Therap. 2021;29(1):8. Published 2021 Feb 17.

56. Courtney CA, Steffen AD, Fernández-de-Las-Peñas C, Kim J, Chmell SJ. Joint Mobilization Enhances Mechanisms of Conditioned Pain Modulation in Individuals With Osteoarthritis of the Knee. J Orthop Sports Phys Ther. 2016 Mar;46(3):168-76.

57. Csapo R, Alegre LM. Effects of Kinesio(®) taping on skeletal muscle strength-A meta-analysis of current evidence. J Sci Med Sport. 2014 Jun 27.

58. Cupler ZA, Alrwaily M, Polakowski E, Mathers KS, Schneider MJ. Taping for conditions of the musculoskeletal system: an evidence map review. Chiropr Man Therap. 2020 Sep 15;28(1):52.

59. Daniel DM. Non-surgical spinal decompression therapy: does the scientific literature support efficacy claims made in the advertising media? Chiropr Osteopat. 2007;15:7.

60. Delitto A, George SZ, Van Dillen LR, Whitman JM, Sowa G, Shekelle P, et al.; Orthopaedic Section of the American Physical Therapy Association. Low back pain. J Orthop Sports Phys Ther. 2012 Apr;42(4):A1-57. Epub 2012 Mar 30.

61. Demirel A, Yorubulut M, Ergun N. Regression of lumbar disc herniation by physiotherapy. Does non-surgical spinal decompression therapy make a difference? Double-blind randomized controlled trial. J Back Musculoskelet Rehabil. 2017 Sep 22;30(5):1015-1022.

62. Deng P, Zhao Z, Zhang S, Xiao T, Li Y. Effect of kinesio taping on hemiplegic shoulder pain: A systematic review and meta-analysis of randomized controlled trials. Clin Rehabil. 2021;35(3):317-331.

63. de Oliveira FCL, Pairot de Fontenay B, Bouyer LJ, Desmeules F, Roy JS. Kinesiotaping for the Rehabilitation of Rotator Cuff-Related Shoulder Pain: A Randomized Clinical Trial. Sports Health. 2021;13(2):161-172.

64. de Sire A, Curci C, Ferrara M, et al. Efficacy of kinesio taping on hand functioning in patients with mild carpal tunnel syndrome. A double-blind randomized controlled trial [published online ahead of print, 2021 Apr 14]. J Hand Ther. 2021;S0894-1130(21)00058-2.

65. Dion S, Wong JJ, Côté P, Yu H, Sutton D, Randhawa K, Southerst D, Varatharajan S, Stern PJ, Nordin M, Chung C, D'Angelo K, Dresser J, Brown C, Menta R, Ammendolia C, Shearer HM, Stupar M, Ameis A, Mior S, Carroll LJ, Jacobs C, Taylor-Vaisey A. Are Passive Physical Modalities Effective for the Management of Common Soft Tissue Injuries of the Elbow?: A Systematic Review by the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration. Clin J Pain. 2017 Jan;33(1):71-86.

66. Dibai-Filho AV, Guirro RR. Evaluation of myofascial trigger points using infrared thermography: a critical review of the literature. J Manipulative Physiol Ther. 29 2015;38(1):86-92.

67. Dıraçoğlu D, Vural M, Karan A, Aksoy C. Effectiveness of dry needling for the treatment of temporomandibular myofascial pain: a double-blind, randomized, placebo controlled study. J Back Musculoskelet Rehabil. 2012;25(4):285-90.

68. Dobson D, Lucassen PLBJ, Miller JJ, Vlieger AM, Prescott P, Lewith G. Manipulative therapies for infantile colic. Cochrane Database Syst Rev. 2012;12:CD004796.

69. Dommerholt J, Hooks T, Finnegan M, Grieve R. A critical overview of the current myofascial pain literature - March 2016. J Bodyw Mov Ther. 2016 Apr;20(2):397-408.

70. Dong W, Goost H, Lin XB, Burger C, Paul C, Wang ZL, Zhang TY, Jiang ZC, Welle K, Kabir K. Treatments for shoulder impingement syndrome: a PRISMA systematic review and network meta-analysis. Medicine (Baltimore). 2015 Mar;94(10):e510.

71. Driehuis F, Hoogeboom TJ, Nijhuis-van der Sanden MWG, de Bie RA, Staal JB. Spinal manual therapy in infants, children and adolescents: A systematic review and meta-analysis on treatment indication, technique and outcomes. PLoS One. 2019 Jun 25;14(6):e0218940.

72. Dry Hydromassage. Princeton, MN: Sidmar Manufacturing, Inc.; 2001-2005. Accessed October 23, 2022. Available at URL address: http://www.sidmar.com/

73. Durall CJ. Examination and treatment of cuboid syndrome: a literature review. Sports Health. 2011 Nov;3(6):514-9.

74. Ebadi S, Henschke N, Nakhostin Ansari N, Fallah E, van Tulder MW. Therapeutic ultrasound for chronic low-back pain. Cochrane Database Syst Rev. 2014 Mar 14;3:CD009169

75. Espí-López GV, Serra-Añó P, Vicent-Ferrando J, Sánchez-Moreno-Giner M, Arias-Buría JL, Cleland J, Fernández-de-Las-Peñas C. Effectiveness of Inclusion of Dry Needling in a Multimodal Therapy Program for Patellofemoral Pain: A Randomized Parallel-Group Trial. J Orthop Sports Phys Ther. 2017 Jun;47(6):392-401.

76. Everett CR, Patel RK. A systematic literature review of nonsurgical treatment in adult scoliosis. Spine (Phila Pa 1976). 2007 Sep 1;32(19 Suppl):S130-4.

77. Fan Y, Ren Q, To MKT, Cheung JPY. Effectiveness of scoliosis-specific exercises for alleviating adolescent idiopathic scoliosis: a systematic review. BMC Musculoskelet Disord. 2020 Jul 27;21(1):495.

78. Farabaugh RJ, Dehen MD, Hawk C. Management of chronic spine-related conditions: consensus recommendations of a multidisciplinary panel. Council of Chiropractic Guidelines and Practice Parameters (CCGPP). J Manipulative Physiol Ther. 2010 Sep;33(7):484-92.

79. Fernández-de-Las-Peñas C, Pérez-Bellmunt A, Llurda-Almuzara L, Plaza-Manzano G, De-la-Llave-Rincón AI, Navarro-Santana MJ. Is Dry Needling Effective for the Management of Spasticity, Pain, and Motor Function in Post-Stroke Patients? A Systematic Review and Meta-Analysis. Pain Med. 2021 Feb 4;22(1):131-141.

80. Ferrance RJ, Miller J. Chiropractic diagnosis and management of non-musculoskeletal conditions in children and adolescents. Chiropr Osteopat.2010 Jun 2;18:14.

81. Fishman SM, Ballantyne JC, Rathmell JP editors. Bonica's management of pain 4th ed. Lippincott Williams & Wilkins: Philadelphia; 2010.

82. Frontera W, Silver J, Rizzo TD editors. Essentials of physical medicine and rehabilitation. 3nd ed. Philadelphia, PA: Saunders, an imprint of Elsevier Inc.; 2014.

83. Furlan AD, Giraldo M, Baskwill A, Irvin E, Imamura M. Massage for low-back pain. Cochrane Database Syst Rev. 2015 Sep 1;(9):CD001929.

84. Gatt M, Willis S, Leuschner S. A meta-analysis of the effectiveness and safety of kinesiology taping in the management of cancer-related lymphoedema. Eur J Cancer Care (Engl). 2016 May 11.

85. Gattie E, Cleland JA, Snodgrass S. The Effectiveness of Trigger Point Dry Needling for Musculoskeletal Conditions by Physical Therapists: A Systematic Review and Meta-analysis. J Orthop Sports Phys Ther. 2017 Mar;47(3):133-149.

86. Gattie E, Cleland JA, Pandya J, Snodgrass S. Dry Needling Adds No Benefit to the Treatment of Neck Pain: A Sham-Controlled Randomized Clinical Trial With 1-Year Follow-up. J Orthop Sports Phys Ther. 2021 Jan;51(1):37-45.

87. Gay RE, Bronfert G, Evans RL. Distraction manipulation of the lumbar spine: A review of the literature. J Manipulative Physiol Ther. 2005 May;28(4):266-73.

88. Gerber LH, Sikdar S, Aredo JV, Armstrong K, Rosenberger WF, Shao H, Shah JP. Beneficial Effects of Dry Needling for Treatment of Chronic Myofascial Pain Persist for 6 Weeks After Treatment Completion. PM R. 2016 Jun 11. pii: S1934-32 1482(16)30180-0.

89. Gleberzon BJ, Arts J, Mei A, McManus EL. The use of spinal manipulative therapy for pediatric health conditions: a systematic review of the literature. J Can Chiropr Assoc. 2012 Jun;56(2):128-41.

90. Globe GA, Morris CE, Whalen WM, Farabaugh RJ, Hawk C; Council on Chiropractic Guidelines and Practice Parameter. Chiropractic management of low back disorders: report from a consensus process. J Manipulative Physiol Ther. 2008 Nov-Dec;31(9):651-8.

91. Goertz M, Thorson D, Bonsell J, Bonte B, Campbell R, Haake B, et al. Low Back Pain, Adult Acute and Subacute. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2018 Mar. Accessed October 23, 2022. Available at URL address: https://www.icsi.org/guideline/low-back-pain/

92. Goertz CM, Hurwitz EL, Murphy BA, Coulter ID. Extrapolating Beyond the Data in a Systematic Review of Spinal Manipulation for Nonmusculoskeletal Disorders: A Fall From the Summit. J Manipulative Physiol Ther. 2021;44(4):271-279.

93. González-Iglesias J, Fernández-de-Las-Peñas C, Cleland JA, et al. Short-term effects of cervical kinesio taping on pain and cervical range of motion in patients with acute whiplash injury: A randomized clinical trial. J Orthop Sports Phys Ther. 2009; 39(7):515-521.

94. Gotlib A, Rupert R. Chiropractic manipulation in pediatric health conditions - an updated systematic review. Chiropr Osteopat. 2008 Sep 12;16:11.

95. Gross A, Miller J, D'Sylva J, Burnie SJ, Goldsmith CH, Graham N, Haines T, Brønfort G, Hoving JL; COG. Manipulation or mobilisation for neck pain: a Cochrane Review. Man Ther. 2010 Aug;15(4):315-33. Epub 2010 May 26.

96. Guide to Physical Therapist Practice 3.0. 2nd ed. Alexandria, VA: American Physical Therapy Association; 2014.

97. H2OMassage System. Winnipeg, MB, Canada. Accessed October 23, 2022. Available at URL address: http://www.h2omassage.com/

98. Haldeman S, Chapman-Smith D, Peterson DM. Guidelines for chiropractic quality assurance and practice parameters: proceedings of the Mercy Center Consensus Conference. Gaithersburg, MD: Aspen Publishing, 1993

99. Halseth T, McChesney JW, Debeliso M, Vaughn R, Lien J. The effects of kinesio™ taping on proprioception at the ankle. J Sports Sci Med. 2004 Mar 1;3(1):1-7.

100. Harris GR, Susman JL. Managing musculoskeletal complaints with rehabilitation therapy: summary of the Philadelphia Panel evidence-based clinical practice guidelines on musculoskeletal rehabilitation interventions. J Fam Pract. 2002 Dec;51(12):1042-6.

101. Hawk C, Schneider M, Dougherty P, Gleberzon BJ, Killinger LZ. Best practices recommendations for chiropractic care for older adults: results of a consensus process. J Manipulative Physiol Ther. 2010 JulAug;33(6):464-73.

102. Heddon S, Saulnier N, Mercado J, Shalmiyev M, Berteau JP. Systematic review shows no strong evidence regarding the use of elastic taping for pain improvement in patients with primary knee osteoarthritis. Medicine (Baltimore). 2021;100(13):e25382.

103. Hondras MA, Linde K, Jones AP. Manual therapy for asthma. Cochrane Database. Syst Rev. 2005 Apr 18;(2):CD001002.

104. Hoogvliet P, Randsdorp MS, Dingmanse R, Koes BW, Huisstede BM. Does effectiveness of exercise therapy and mobilization techniques offer guidance for the treatment of lateral and medial epicondylitis? A systematic review. Br J Sports Med 2013;May 10 24 (Epub ahead of print).

105. Huang T, Shu X, Huang YS, Cheuk DK. Complementary and miscellaneous interventions for nocturnal enuresis in children. Cochrane Database Syst Rev. 2011 Dec 7;(12):CD005230.

106. Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, et al. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. J Manipulative Physiol Ther. 2009 Feb;32(2 Suppl):S141-75.

107. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine. 2006 Mar 15;31(6):611-21; discussion 622.

108. ICF Project Published Guidelines. Clinical Practice Guidelines. Orthopaedic Section, American Physical Therapy Association. Accessed October 23, 2022. Available at URL address: https://www.orthopt.org/content/practice/clinical-practice-guidelines

109. Iijima H, Takahashi M. Microcurrent Therapy as a Therapeutic Modality for Musculoskeletal Pain: A Systematic Review Accelerating the Translation From Clinical Trials to Patient Care. Arch Rehabil Res Clin Transl. 2021;3(3):100145. Published 2021 Jul 21.

110. Jassi FJ, Del Antônio TT, Azevedo BO, Moraes R, George SZ, Chaves TC. Star-Shape Kinesio Taping Is Not Better Than a Minimal Intervention or Sham Kinesio Taping for Pain Intensity and Postural Control in Chronic Low Back Pain: A Randomized Controlled Trial. Arch Phys Med Rehabil. 2021;102(7):1352-1360.e3.

111. Jayaseelan DJ, T Faller B, H Avery M. The utilization and effects of filiform dry needling in the management of tendinopathy: a systematic review. Physiother Theory Pract. 2021 Apr 27:1-13.

112. Kalichman, L and Vulfsons, S. Dry needling in the management of musculoskeletal pain. J Am Board Fam Med. 2010;23(5): 640-646.

113. Kalron A, Bar-Sela S. A systematic review of the effectiveness of Kinesio Taping--fact or fashion? Eur J Phys Rehabil Med. 2013 Oct; 49(5):699-709.

114. Kaminskyj A, Frazier M, Johnstone K, Gleberzon BJ. Chiropractic care for patients with asthma: A systematic review of the literature. J Can Chiropr Assoc. 2010 Mar;54(1):24–32.

115. Kamonseki DH, Lopes EP, van der Meer HA, Calixtre LB. Effectiveness of manual therapy in patients with tension-type headache. A systematic review and meta-analysis. Disabil Rehabil. 2022;44(10):1780-1789. doi:10.1080/09638288.2020.1813817.

116. Kang JI, Jeong DK, Choi H.. Effect of spinal decompression on the lumbar muscle activity and disk height in patients with herniated intervertebral disk. J Phys Ther Sci. 2016 Nov;28(11):3125-3130.

117. Karaborklu Argut S, Celik D, Kilicoglu OI. The Combination of Exercise and Manual Therapy Versus Exercise Alone in Total Knee Arthroplasty Rehabilitation: A Randomized Controlled Clinical Trial. PM R. 2021;13(10):1069-1078. doi:10.1002/pmrj.12542.

118. Karpouzis F, Bonello R, Pollard H. Chiropractic care for paediatric and adolescent Attention-Deficit/Hyperactivity Disorder: A systematic review. Chiropr Osteopat. 2010 Jun 2;18:13.

119. Kashif M, Albalwi A, Alharbi A, Iram H, Manzoor N. Comparison of subtalar m obilization with conventional physiotherapy treatment for the management of plantar fasciitis. J Pak Med Assoc. 2021;71(12):2705-2709. Doi:10.47391/JPMA.1049.

120. Kietrys DM, Palombaro KM, Azzaretto E, Hubler R, Schaller B, Schlussel JM, Tucker M. Effectiveness of Dry Needling for Upper Quarter Myofascial Pain: A Systematic Review and Meta-analysis. J Orthop Sports Phys Ther. 2013 Jun 11

121. Khan I, Ahmad A, Ahmed A, Sadiq S, Asim HM. Effects of dry needling in lower extremity myofascial trigger points. J Pak Med Assoc. 2021;71(11):2596-2603. doi:10.47391/JPMA.01398.

122. Kong LJ, Zhan HS, Cheng YW, Yuan WA, Chen B, Fang M. Massage therapy for neck and shoulder pain: a systematic review and meta-analysis. Evid Based Complement Alternat Med. 2013;2013:613279.

123. Kundakci B, Kaur J, Goh SL, et al. Efficacy of nonpharmacological interventions for individual features of fibromyalgia: a systematic review and meta-analysis of randomised controlled trials. Pain. 2022;163(8):1432-1445. doi:10.1097/j.pain.0000000000002500.

124. Lawrence DJ, Meeker W, Branson R, Bronfort G, Cates JR, Haas M, Haneline M,Micozzi M, Updyke W, Mootz R, Triano JJ, Hawk C. Chiropractic management of lo back pain and low back-related leg complaints: a literature synthesis. J Manipulative Physiol Ther. 2008 Nov-Dec;31(9):659-74.

125. Li Y, Yin Y, Jia G, Chen H, Yu L, Wu D. Effects of kinesiotape on pain and disability in individuals with chronic low back pain: a systematic review and meta-analysis of randomized controlled trials. Clin Rehabil. 2019 Apr;33(4):596-606.

126. Lim EC, Tay MG. Kinesio taping in musculoskeletal pain and disability that lasts for more than 4 weeks: is it time to peel off the tape and throw it out with the sweat? A systematic review with meta-analysis focused on pain and also methods of tape application. Br J Sports Med. 2015 Dec; 49(24):1558-66.

127. Lin S, Zhu B, Huang G, Wang C, Zeng Q, Zhang S. Short-Term Effect of Kinesiotaping on Chronic Nonspecific Low Back Pain and Disability: A Meta-Analysis of Randomized Controlled Trials. Phys Ther. 2020 Feb 7;100(2):238-254.

128. Liu L, Huang QM, Liu QG, Ye G, Bo CZ, Chen MJ, Li P. Effectiveness of dry needling for myofascial trigger points associated with neck and shoulder pain: a systematic review and meta-analysis. Arch Phys Med Rehabil. 2015 May;96(5):944-55.

129. Liu L, Huang QM, Liu QG, Thitham N, Li LH, Ma YT, Zhao JM. Evidence for Dry Needling in the Management of Myofascial Trigger Points Associated with Low Back Pain: A Systematic Review and Meta-analysis. Arch Phys Med Rehabil. 2017 Jul 6. pii: S0003-9993(17)30452-5.

130. Llurda-Almuzara L, Labata-Lezaun N, Meca-Rivera T, Navarro-Santana MJ, Cleland JA, Fernández-de-Las-Peñas C, Pérez-Bellmunt A. Is Dry Needling Effective for the Management of Plantar Heel Pain or Plantar Fasciitis? An Updated Systematic Review and Meta-Analysis. Pain Med. 2021 Jul 25;22(7):1630-1641.

131. Lucado AM, Dale RB, Vincent J, Day JM. Do joint mobilizations assist in the recovery of lateral elbow tendinopathy? A systematic review and meta-analysis. J Hand Ther. 2019;32(2):262-276.e1.

132. Luo WH, Li Y. Current Evidence Does Support the Use of KT to Treat Chronic Knee Pain in Short Term: A Systematic Review and Meta-Analysis. Pain Res Manag. 2021;2021:5516389. Published 2021 Mar 23.

133. Luz Júnior MAD, Almeida MO, Santos RS, Civile VT, Costa LOP. Effectiveness of Kinesio Taping in Patients With Chronic Nonspecific Low Back Pain: A Systematic Review With Meta-analysis. Spine (Phila Pa 1976). 2019 Jan 1;44(1):68-78.

134. Macario A, Pergolizzi JV. Systematic literature review of spinal decompression via motorized traction for chronic discogenic low back pain. Pain Pract. 2006 18 Sep;6(3):171-8.

135. Macario A, Richmond C, Auster M, Pergolizzi JV. Treatment of 94 outpatients with chronic discogenic low back pain with the DRX9000: a retrospective chart review. Pain Pract. 2008 Mar;8(1):11-7.

136. Macedo LG, Saragiotto BT, Yamato TP, Costa LO,Menezes Costa LC, Ostelo RW, Maher CG. Motor control exercise for acute non-specific low back pain. Cochrane Database Syst Rev. 2016 Feb 10;2:CD012085.

137. Mangum K, Partna L, Vavrek D. Spinal manipulation for the treatment of hypertension: a systematic qualitative literature review. J Manipulative Physiol Ther. 2012;35(3):235-43.

138. Martimbianco ALC, Ferreira RES, Latorraca COC, Bussadori SK, Pacheco RL, Riera R. Photobiomodulation with low-level laser therapy for treating Achilles tendinopathy: a systematic review and meta-analysis. Clin Rehabil. 2020 Jun;34(6):713-722

139. Martonick N, Kober K, Watkins A, DiEnno A, Perez C, Renfro A, Chae S, Baker R. The Effect of Kinesio Tape on Factors for Neuromuscular Control of the Lower-Extremity: A Critically Appraised Topic. J Sport Rehabil. 2020 Mar 28:1-6

140. McIntyre A, Viana R, Janzen S, Mehta S, Pereira S, Teasell R. Systematic review and meta-analysis of constraint-induced movement therapy in the hemiparetic upper extremity more than six months post stroke. Top Stroke Rehabil. 2012 Nov-Dec;19(6):499-513.

141. Mehlman CT. Idiopathic Scoliosis. Jun 30, 2004. Updated Jan 29, 2016. emedicine. Accessed October 23, 2022. Available at URL address: http://www.emedicine.com/orthoped/TOPIC504.HTM

142. Montalvo AM, Cara EL, Myer GD. Effect of kinesiology taping on pain in individuals with musculoskeletal injuries: Systematic review and meta-analysis. Phys Sportsmed. 2014 May; 42(2):48-57.

143. Mostafavifar M, Wertz J, Borchers J. A systematic review of the effectiveness of kinesio taping for musculoskeletal injury. Phys Sportsmed. 2012 Nov;40(4):33-40.

144. Mousavi-Khatir SR, Fernández-de-Las-Peñas C, Saadat P, Javanshir K, Zohrevand A. The Effect of Adding Dry Needling to Physical Therapy in the Treatment of Cervicogenic Headache: A Randomized Controlled Trial. Pain Med. 2022;23(3):579-589. doi:10.1093/pm/pnab312.

145. Nair HKR. Microcurrent as an adjunct therapy to accelerate chronic wound healing and reduce patient pain. J Wound Care. 2018 May 2;27(5):296-306.

146. National Center for Complementary and Alternative Medicine (NCCAM). National Institutes of Health. Massage Therapy for Health Purposes: What You Need To Know. September 2006; updated April 2019. Accessed: October 23, 2022. Available at URL address: https://nccih.nih.gov/health/massage/massageintroduction.htm.

147. National Institutes of Health. National Institute of Arthritis and Musculoskeletal and Skin Disease. Questions and answers about scoliosis in children and adolescents. NIH Publication No. 13–4862. Dec 2019. Accessed October 23, 2022. Available at URL address: http://www.niams.nih.gov/Health_Info/Scoliosis/default.asp.

148. Navarro-Santana MJ, Sanchez-Infante J, Gómez-Chiguano GF, Cleland JA, López-de-Uralde-Villanueva I, Fernández-de-Las-Peñas C, Plaza-Manzano G. Effects of trigger point dry needling on lateral epicondylalgia of musculoskeletal origin: a systematic review and meta-analysis. Clin Rehabil. 2020 Nov;34(11):1327-1340.

149. Navarro-Santana MJ, Gómez-Chiguano GF, Cleland JA, Arias-Buría JL, Fernández-de-Las-Peñas C, Plaza-Manzano G. Effects of Trigger Point Dry Needling for Nontraumatic Shoulder Pain of Musculoskeletal Origin: A Systematic Review and Meta-Analysis. Phys Ther. 2021 Feb 4;101(2):pzaa216.

150. Navarro-Santana MJ, Sanchez-Infante J, Fernández-de-Las-Peñas C, Cleland JA, Martín-Casas P, Plaza-Manzano G. Effectiveness of Dry Needling for Myofascial Trigger Points Associated with Neck Pain Symptoms: An Updated Systematic Review and Meta-Analysis. J Clin Med. 2020 Oct 14;9(10):3300.

151. Nelson NL. Kinesio taping for chronic low back pain: A systematic review. J Bodyw Mov Ther. 2016 Jul; 20(3):672-81.

152. North American Spine Society (NASS). Diagnosis and treatment of degenerative lumbar spondylolisthesis. Burr Ridge (IL): North American Spine Society (NASS); 2014.

153. North American Spine Society (NASS). Diagnosis and treatment of degenerative lumbar spinal stenosis. Burr Ridge (IL): North American Spine Society (NASS); 2011.

154. North American Spine Society (NASS). Clinical guidelines for diagnosis and treatment of lumbar disc herniation with radiculopathy. Burr Ridge (IL): North American Spine Society (NASS); 2012.

155. Nunes GS, Feldkircher JM, Tessarin BM, Bender PU, da Luz CM, de Noronha M. Kinesio taping does not improve ankle functional or performance in people with or without ankle injuries: Systematic review and meta-analysis. Clin Rehabil. 2021;35(2):182-199.

156. Ottawa Panel. Ottawa Panel evidence-based clinical practice guidelines for therapeutic exercises in the management of rheumatoid arthritis in adults. Phys Ther. 2004 Oct;84(10):934-72.

157. Ottawa Panel. Ottawa panel evidence-based clinical practice guidelines for therapeutic exercises and manual therapy in the management of osteoarthritis. Phys Ther 2005 Sep;85(9):907-71.

158. Owen PJ, Miller CT, Mundell NL, Verswijveren SJJM, Tagliaferri SD, Brisby H, Bowe SJ, Belavy DL. Which specific modes of exercise training are most effective for treating low back pain? Network meta-analysis. Br J Sports Med. 2020 Nov;54(21):1279-1287.

159. Parreira Pdo C, Costa Lda C, Hespanhol Junior LC, Lopes AD, Costa LO. Current evidence does not support the use of Kinesio Taping in clinical practice: a systematic review. J Physiother. 2014 Mar; 60(1):31-9.

160. Patel KC, Gross A, Graham N, Goldsmith CH, Ezzo J, Morien A, Peloso PM. Massage for mechanical neck disorders. Cochrane Database Syst Rev. 2012 Sep12;9:CD004871.

161. Peter WF, Jansen MJ, Hurkmans EJ, Bloo H, Dekker J, Dilling RG, et al.; Guideline Steering Committee - Hip and Knee Osteoarthritis. Physiotherapy in hip and knee osteoarthritis: development of a practice guideline concerning initial assessment, treatment and evaluation. Acta Reumatol Port. 2011 Jul-Sep;36(3):268-81.

162. Pereira Alfredo P et al. Efficacy of low level laser therapy associated with exercises in knee osteoarthritis: a randomized double-blind study. Clin Rehabil. 2011;26(6):523-533.

163. Philadelphia Panel. Philadelphia Panel evidence-based clinical practice guidelines on selected rehabilitation interventions for shoulder pain. Phys Ther. 2001 Oct;81(10):1719-30. Review. PubMed PMID: 11589645.

164. Philadelphia Panel. Philadelphia Panel evidence-based clinical practice guidelines on selected rehabilitation interventions for neck pain. Phys Ther. 2001 Oct;81(10):1701-17.

165. Philadelphia Panel. Philadelphia Panel evidence-based clinical practice guidelines on selected rehabilitation interventions for knee pain. Phys Ther. 2001 Oct;81(10):1675-700.

166. Philadelphia Panel. Philadelphia Panel evidence-based clinical practice guidelines on selected rehabilitation interventions for low back pain. Phys Ther. 2001 Oct;81(10):1641-74.

167. Pieters L, Lewis J, Kuppens K, Jochems J, Bruijstens T, Joossens L, Struyf F. An Update of Systematic Reviews Examining the Effectiveness of Conservative Physical Therapy Interventions for Subacromial Shoulder Pain. J Orthop Sports Phys Ther. 2020 Mar;50(3):131-141.

168. Pinheiro YT, E Silva RL, de Almeida Silva HJ, et al. Does current evidence support the use of kinesiology taping in people with knee osteoarthritis?. Explore (NY). 2021;17(6):574-577.

169. Pohlman KA, Holton-Brown MS. Otitis media and spinal manipulative therapy: a literature review. J Chiropr Med. 2012 Sep;11(3):160–9.

170. Poitras S, Brosseau L. Evidence-informed management of chronic low back pain with transcutaneous electrical nerve stimulation, interferential current, electrical muscle stimulation, ultrasound, and thermotherapy. Spine J. 2008 Jan-Feb;8(1):226-33.

171. Pourahmadi M, Dommerholt J, Fernández-de-Las-Peñas C, Koes BW, Mohseni-Bandpei MA, Mansournia MA, Delavari S, Keshtkar A, Bahramian M. Dry Needling for the Treatment of Tension-Type, Cervicogenic, or Migraine Headaches: A Systematic Review and Meta-Analysis. Phys Ther. 2021 May 4;101(5):pzab068.

172. Rodríguez-Mansilla J, González-Sánchez B, De Toro García Á, Valera-Donoso E, Garrido-Ardila EM, Jiménez-Palomares M, González López-Arza MV. Effectiveness of dry needling on reducing pain intensity in patients with myofascial pain syndrome: a Meta-analysis. J Tradit Chin Med. 2016 Feb;36(1):1-13.

173. Roll SC, Hardison ME. Effectiveness of Occupational Therapy Interventions for Adults With Musculoskeletal Conditions of the Forearm, Wrist, and Hand: A Systematic Review. Am J Occup Ther. 2017;71(1):7101180010p1-7101180010p12.

174. Romano M, Minozzi S, Bettany-Saltikov J, Zaina F, Chockalingam N, Kotwicki T, et al. Exercises for adolescent idiopathic scoliosis. Cochrane Database Syst Rev. 2012 Aug 15;(8):CD007837.

175. Rubinstein SM, Leboeuf-Yde C, Knol DL, de Koekkoek TE, Pfeifle CE, van Tulder MW. The benefits outweigh the risks for patients undergoing chiropractic care for neck pain: a prospective, multicenter, cohort study. J Manipulative Physiol Ther. 2007 Jul-Aug;30(6):408-18.

176. Savva C, Karagiannis C, Korakakis V, Efstathiou M. The analgesic effect of joint mobilization and manipulation in tendinopathy: a narrative review. J Man Manip Ther. 2021;29(5):276-287. doi:10.1080/10669817.2021.1904348

177. Sanchis-Sánchez E, Vergara-Hernández C, Cibrián RM, Salvador R, Sanchis E, Codoñer- Franch P. Infrared thermal imaging in the diagnosis of musculoskeletal injuries: a systematic review and meta-analysis. AJR Am J Roentgenol. 2014;203(4):875-82.

178. Sánchez-Infante J, Navarro-Santana MJ, Bravo-Sánchez A, Jiménez-Diaz F, Abián-Vicén J. Is Dry Needling Applied by Physical Therapists Effective for Pain in Musculoskeletal Conditions? A Systematic Review and Meta-Analysis. Phys Ther. 2021 Mar 3;101(3):pzab070.

179. Santos TS, Oliveira KKB, Martins LV, Vidal APC. Effects of manual therapy on body posture: Systematic review and meta-analysis. Gait Posture. 2022;96:280-294. doi:10.1016/j.gaitpost.2022.06.010

180. Saragiotto BT, Maher CG, Yamato TP, Costa LO, Menezes Costa LC, Ostelo RW, Macedo LG. Motor control exercise for chronic non-specific low-back pain. Cochrane Database Syst Rev. 2016 Jan 8;(1):CD012004.

181. Scherl SA. Adolescent idiopathic scoliosis: Management and prognosis. In: UpToDate, Post TW (Ed), UpToDate, Waltham, MA.

182. Schreiber S, Parent EC, Hill DL, Hedden DM, Moreau MJ, Southon SC. Patients with adolescent idiopathic scoliosis perceive positive improvements regardless of change in the Cobb angle - Results from a randomized controlled trial comparing a 6-month Schroth intervention added to standard care and standard care alone. SOSORT 2018 Award winner. BMC Musculoskelet Disord. 2019;20(1):319. Published 2019 Jul 8.

183. Seleviciene V, Cesnaviciute A, Strukcinskiene B, Marcinowicz L, Strazdiene N, Genowska A. Physiotherapeutic Scoliosis-Specific Exercise Methodologies Used for Conservative Treatment of Adolescent Idiopathic Scoliosis, and Their Effectiveness: An Extended Literature Review of Current Research and Practice. Int J Environ Res Public Health. 2022;19(15):9240. Published 2022 Jul 28. doi:10.3390/ijerph19159240.

184. Silberstein N. Dry hydrotherapy: don't add water. Rehab Manag. 2006 Jun;19(5):22-3.

185. Skelly AC, Chou R, Dettori JR, et al. Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review. Rockville (MD): Agency for Healthcare Research and Quality (US); June 2018.

186. Skelly AC, Chou R, Dettori JR, Turner JA, Friedly JL, Rundell SD, Fu R, Brodt ED, Wasson N, Kantner S, Ferguson AJR. Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review Update [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2020 Apr. Report No.: 20-EHC009. PMID: 32338846.

187. Sousa Filho LF, Barbosa Santos MM, Dos Santos GHF, da Silva Júnior WM. Corticosteroid injection or dry needling for musculoskeletal pain and disability? A systematic review and GRADE evidence synthesis. Chiropr Man Therap. 2021;29(1):49. Published 2021 Dec 2. doi:10.1186/s12998-021-00408-y.

188. Steele J, Bruce-Low S, Smith D. A review of the clinical value of isolated lumbar extension resistance training for chronic low back pain. PMR. 2015 Feb;7(2):169-87.

189. Steele J, Bruce-Low S, Smith D, Jessop D, Osborne N. A randomized controlled trial of limited range of motion lumbar extension exercise in chronic low back pain. Spine (Phila Pa 1976). 2013 Jul 1;38(15):1245-52.

190. Steele J, Fisher J, Bruce-Low S, Smith D, Osborne N, Newell D. Variability in Strength, Pain, and Disability Changes in Response to an Isolated Lumbar Extension Resistance Training Intervention in Participants with Chronic Low Back Pain. Healthcare (Basel). 2017 Oct 16;5(4). pii: E75..

191. Taylor NF, Dodd KJ, Shields N, Bruder A. Therapeutic exercise in physiotherapy practice is beneficial: a summary of systematic reviews 2002-2005. Aust J Physiother. 2007;53(1):7-16.

192. Tekin L, Akarsu S, Durmuş O, Cakar E, Dinçer U, Kıralp MZ. The effect of dry needling in the treatment of myofascial pain syndrome: a randomized double-blinded placebo-controlled trial.Clin Rheumatol. 2013;32(3):309-15.

193. Today's Physical Therapist: A Comprehensive Review of a 21st Century Health Care Profession. Alexandria, VA: APTA; 2011.

194. Tough EA, White AR, Cummings TM, Richards SH, Campbell JL. Acupuncture and dry needling in the management of myofascial trigger point pain: a systematic review and meta-analysis of randomised controlled trials. Eur J Pain. 2009;13(1):3-10.

195. Troyanovich SJ, Harrison D, Harrison DD, Harrison SO, Janik T, Holland B. Chiropractic biophysics digitized radiographic mensuration analysis of the anteroposterior cervicothoracic view: a reliability study. J Manipulative Physiol Ther. 2000 Sep;23(7):476-82.

196. Valdes K, Marik T. A systematic review of conservative interventions for osteoarthritis of the hand. Journal of Hand Therapy 2010;23(4):334-50.

197. van Middelkoop M, Rubinstein SM, Kuijpers T, Verhagen AP, Ostelo R, Koes BW, van Tulder MW. A systematic review on the effectiveness of physical and rehabilitation interventions for chronic non-specific low back pain. Eur Spine J. 2011 Jan;20(1):19-39.

198. van Tulder M, Becker A, Bekkering T, Breen A, del Real MT, Hutchinson A, Koes B, Laerum E, Malmivaara A; COST B13 Working Group on Guidelines for the Management of Acute Low Back Pain in Primary Care. Chapter 3. European guidelines for the management of acute nonspecific low back pain in primary care. Eur Spine J. 2006 Mar;15 Suppl 2:S169-91.

199. van Middelkoop M, Rubinstein SM, Verhagen AP, Ostelo RW, Koes BW, van Tulder MW. Exercise therapy for chronic nonspecific low-back pain. Best Pract Res Clin Rheumatol. 2010 Apr;24(2):193-204.

200. Vohra S, Johnston BC, Cramer K, Humphreys K. Adverse events associated with pediatric spinal manipulation: a systematic review. Pediatrics. 2007 Jan;119(1):e275-83. Epub 2006 Dec 18.

201. Walsh NE, Brooks P, Hazes JM, et al. Standards of care for acute and chronic musculoskeletal pain: The bone and joint decade (2000-2010). Arch Phys Med Rehabil. 2008;89:1830-1845.

202. Wang X, Sun Q, Wang M, et al. Electrical Dry Needling Plus Corticosteroid Injection for Osteoarthritis of the Knee: A Randomized Controlled Trial. Arch Phys Med Rehabil. 2022;103(5):858-866. doi:10.1016/j.apmr.2021.12.026.

203. Washington State Department of Labor and Industries. Conservative care options for work-related mechanical shoulder conditions. Olympia (WA): Washington State Department of Labor and Industries; 2014 Apr 17.p. Accessed October 23, 2022. Available from URL address: https://www.guidelinecentral.com/summaries/conservative-care-options-for-work-related-mechanical-shoulder-conditions/#section-society

204. Wegner I, Widyahening IS, van Tulder MW, Blomberg SE, de Vet HC, Brønfort G, Bouter LM, van der Heijden GJ. Traction for low-back pain with or without sciatica. Cochrane Database Syst Rev. 2013 Aug 19;8:CD003010.

205. Weiss HR. The method of Katharina Schroth - history, principles and current development. Scoliosis. 2011 Aug 30;6:17.

206. Weleslassie, G. G., Temesgen, M. H., Alamer, A., Tsegay, G. S., Hailemariam, T. T., & Melese, H. (2021). Effectiveness of Mobilization with Movement on the Management of Knee Osteoarthritis: A Systematic Review of Randomized Controlled Trials. Pain research & management, 2021, 8815682. https://doi.org/10.1155/2021/8815682.

207. Westad K, Tjoestolvsen F, Hebron C. The effectiveness of Mulligan's mobilisation with movement (MWM) on peripheral joints in musculoskeletal (MSK) conditions: A systematic review. Musculoskelet Sci Pract. 2019 Feb;39:157-163.

208. Williams S, Whatman C, Hume PA, Sheerin K. Kinesio taping in treatment and prevention of sports injuries: a meta-analysis of the evidence for its effectiveness. Sports Med. 2012 Feb 1;42(2):153-64.

209. Williamson TK, Rodriguez HC, Gonzaba A, Poddar N, Norwood SM, Gupta A. H-Wave® Device Stimulation: A Critical Review. J Pers Med. 2021;11(11):1134. Published 2021 Nov 2.

210. Wolf SL, Winstein CJ, Miller JP, Taub E, Uswatte G, Morris D, et al; EXCITE Investigators. Effect of constraint-induced movement therapy on upper extremity function 3 to 9 months after stroke: the EXCITE randomized clinical trial. JAMA. 2006 Nov 1;296(17):2095-104.

211. Wong JJ, Shearer HM, Mior S, Jacobs C, Côté P, Randhawa K, et al. Are manual therapies, passive physical modalities, or acupuncture effective for the management of patients with whiplash-associated disorders or neck pain and associated disorders? An update of the Bone and Joint Decade Task Force on Neck Pain and Its Associated Disorders by the OPTIMa collaboration. Spine J. 2016 Dec;16(12):1598-1630.

212. Yu H, Côté P, Shearer HM, Wong JJ, Sutton DA, Randhawa KA, et al. Effectiveness of passive physical modalities for shoulder pain: systematic review by the Ontario protocol for traffic injury management collaboration. Phys Ther. 2015 Mar;95(3):306-18.