Non-Pharmacologic Treatments

Although nonopioid medications are recommended as first-line *pharmacologic* treatment for pain, non-pharmacological therapy is consistently regarded as the preferred initial modality of treatment. Below are descriptions of some of these therapies and associated supporting evidence.

Lifestyle Modification

Exercise and sleep restoration are both supported in the literature as effective interventions to modify and/or prevent pain. Exercise has specifically been linked to both nociceptive (such as chronic lower back) and central sensitization (such as fibromyalgia) type pain improvement, and is a relatively easy, self-directed therapy to recommend for capable patients.[1,2] Sleep restoration, while straight-forward in some patients, can be more complicated in others. Studies suggest that cognitive behavioral therapy can be an important piece of both improving sleep quality, which in turn is linked to chronic pain development, as well as decreasing pain severity.[3,4]

Physiotherapy Options

Active therapies such as physical and occupational therapy, therapeutic exercise, aquatic therapy, self-directed activity, neuromuscular re-education, activities of daily living, and functional activities are widely used and accepted methods of care for a variety of types of pain. There is moderate to strong evidence proving the efficacy of exercise therapy for pain relief and functional improvement in patients with musculoskeletal pain.[5] Massage is the manipulation of soft tissue and may include stimulation of acupuncture points and acupuncture channels (acupressure), application of suction cups, and techniques that include pressing, lifting, rubbing, pinching of soft tissues by or with the practitioner's hands. There is good evidence that massage therapy in combination with exercise reduces pain and improves function in the short term for patients with subacute low back pain.[6-8] There is some evidence that 10 weeks of either relaxation massage or structural massage are more effective than usual care and equally effective in improving functional disability and reducing symptoms of pain in people with chronic low back pain with benefits lasting at least six months.[9] There is also some evidence that in the setting of chronic neck pain four weeks of weekly hour-long massage leads to benefits in both pain and function, and there are incremental benefits from multiple massage sessions per week (up to three sessions) over a single massage session.[10]

Psychotherapeutic Interventions

Psychotherapeutic interventions are recommended as a component of treatment for patients with chronic pain; they may also have utility for some patients with acute pain. Cognitive and behavioral interventions have a neurophysiological basis and are well established as diagnostic and therapeutic modalities.[11-13] Patients without behavioral health diagnoses may benefit from interventions that aid in developing better strategies to cope with pain or adjust to disability. A psychologist with a PhD, PsyD, or

EdD or psychiatric MD/DO can perform psychosocial treatment through individual or group therapy. For chronic pain, other licensed mental health providers, licensed health care providers with training in CBT or certified CBT therapists who have experience in treating chronic pain disorders in injured workers may perform treatment in consultation with a PhD, PsyD, EdD or psychiatric MD/DO.

Complementary and Alternative Treatments

Manipulation encompasses a variety of modalities including osteopathic manipulative treatment, chiropractic manipulative treatment, manual therapy, manipulation or mobilization. There is good evidence that manipulation can facilitate pain reduction and improved function for both spinal and extremity injuries.[14-18] Acupuncture is the insertion and removal of filiform needles to stimulate acupoints (acupuncture points) and is recommended for subacute or chronic pain (including low back and knee pain) patients who are trying to increase function, decrease medication usage and have an expressed interest in this modality. There is evidence supporting acupuncture use in reduction of disability and pain in chronic low back pain patients and there is some evidence that acupuncture is better than no acupuncture for axial chronic low back pain.[19-22] There is also evidence supporting acupuncture for reduction of pain or improvement of function among patients older than 50 years with moderate to severe chronic knee pain from symptoms of osteoarthritis.[23] If not otherwise within their professional scope of practice and licensure, those performing acupuncture should have the appropriate credentials, such as LAc, RAc or DiplAc. Other phyto-chemicals and dietary supplements for various pain conditions that have evidence for short-term use include, but are not limited to, avocado-soybean unsaponifiables[24-26], collagen hydrolysate[27-29], passion fruit peel extract[30], Curcuma longa extract[31-34], Boswellia serrata extract[35-37], curcumin[38-40], pycnogenol[41,42], L-carnitine[43,44] undenatured type II collagen[45], methylsulfonylmethane[46], diacerein[47], glucosamine[46,48,49] chondroitin[50], capsaicin[51,52], alpha-lipoic acid[53,54], and theramine[55].

Procedure-Based Interventions

Trigger point injections involve injection of a corticosteroid/anesthetic/saline combination into a tensed muscle. Indications supported by evidence include a palpable taut band or nodule, reproducible pain with palpation and/or a chronic painful conditions.[56-59] Trigger point injections also have been found to be a successful treatment strategy for migraines.[60,61] Trigger point injections of corticosteroids are most effective for adhesive capsulitis, rotator cuff tendinopathy, impingement syndrome and tendon disorders. Trigger point dry needling is a skilled intervention that utilizes a solid filament needle to penetrate the skin and underlying tissues to treat muscular, neural and other connective tissues for the evaluation and management of neuro-musculokeletal conditions, pain, movement impairments and disability. A 2017 systematic review of 15 studies suggests that dry needling is effective in the short term for pain relief, increases range of motion and improves quality of life when compared to no intervention, sham or placebo.[62] TENS treats pain by delivering small electrical impulses through electrodes that flood pain receptors in the body, reducing their ability to transmit pain signals to the brain. Some good-quality systematic reviews suggest that TENS is effective for musculoskeletal and postoperative pain.[63-66]

Practical Application

The above interventions can be split into two categories, self-directed after training vs professionally directed:

Self-Directed After Training	Professionally Directed
Structured exercise	Physical approach + Acupuncture + Assistive devices + Blocks/ablation + Ergonomic modifications + Light therapy + Massage + Osteo-manipulation + Physical therapy/occupational therapy + Regenerative therapies (platelet rich plasma, prolotherapy, stem cells) + Stimulators (peripheral, spinal, deep brain) + Surgeries + Trigger point interventions + Ultrasound
Mind-body therapies + Biofeedback + Movement meditation + Mindfulness	
Relaxation	
Music	
Neurostimulators	
Nutritional approach	
Thermal modalities/balneotherapy	
Sleep hygiene	Psychological approaches/pain behavior therapies + Acceptance and commitment therapy + Cognitive behavioral therapy/ behavioral therapies + Pain education
Spiritual practices	
Tobacco cessation	
Weight reduction	

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