

INTEGRATIVE MEDICINE AND PAIN: ADDITIONAL TOOLS IN YOUR TOOLBOX

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Objectives

- Review evidence-based Integrative Medicine approaches to treatment of painful conditions.
- Identify useful applications of the current research regarding the role of nutrition in the treatment of painful conditions.
- Identify useful applications of current research regarding the role of mind-body approaches to the treatment of painful conditions.

Complementary Alternative Integrative

- Alternative
 - If a non-mainstream practice is used **in place of** conventional medicine, it's considered "complementary".
- Complementary
 - If a non-mainstream practice is used **together with** conventional medicine, it's considered "alternative."
- Integrative
 - Integrative health care often brings conventional and complementary approaches together in a coordinated way. It emphasizes a holistic, patient-focused approach to health care and wellness—often including mental, emotional, functional, spiritual, social, and community aspects—and treating the whole person rather than, for example, one organ system. It aims for well-coordinated care between different providers and institutions.

<https://nccih.nih.gov/health/integrative-health>

Complementary Health Approaches

- Natural Products
 - Herbs (Botanicals)
 - Vitamins and Minerals
 - Probiotics
 - Dietary Supplements
- Mind and Body Practices
 - Yoga
 - Chiropractic and osteopathic manipulation
 - Meditation
 - Acupuncture
 - Relaxation - breathing exercises, guided imagery, progressive muscle relaxation
 - Tai Chi, Qi Gong
 - Hypnotherapy
 - others

Other Complementary Health Approaches

- Traditional Healers
- Ayurvedic Medicine
- Traditional Chinese Medicine
- Homeopathy
- Naturopathy
- Functional Medicine

How are our patients using Complementary and Alternative Therapies

- According to a 2012 national survey, many Americans—more than 30 percent of adults and about 12 percent of children—use health care approaches that are not typically part of conventional medical care or that may have origins outside of usual Western practice.
- Most people who use non-mainstream approaches also use conventional health care.
- GEM Study (Ginkgo for the Evaluation of Memory, 2009)
 - ~75% took at least one Rx and one Dietary Supplement
 - ~33% took 3+ Rx. and 3+ Dietary Supplements
 - 10% combined 5 or each

Nahin RL, Pecha M, Welmerink DB, et al. [Concomitant use of prescription drugs and dietary supplements in ambulatory elderly people](#). *Journal of the American Geriatric Society*. 2009; 57(7):1407-1408.

<https://nccih.nih.gov/health/integrative-health>

PAIN

- Pain is the most common reason medical care is sought as well as the most common reason for seeking integrative treatments.

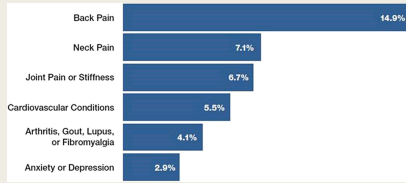
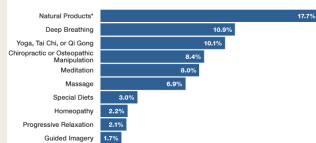


Fig. 3. Diseases/conditions for which complementary health approaches are most frequently used among adults—2012.

From NIH. National Center for Complementary and Integrative Health. Use of complementary and integrative health approaches in the United States, 2012.

Most commonly used approaches (2012)

10 most common complementary health approaches among adults—2012



*Includes vitamins, minerals, herbs, and botanicals.

Source: National Center for Complementary and Integrative Health, National Health and Medical Research Council, and the National Institutes of Health.

What are our patients seeing about Integrative approaches to pain?



What is CHRONIC PAIN?

- Chronic pain is often defined as any pain lasting more than 12 weeks. Whereas acute pain is a normal sensation that alerts us to possible injury, chronic pain is very different. Chronic pain persists—often for months or even longer.
- Chronic pain may arise from an initial injury, such as a back sprain, or there may be an ongoing cause, such as illness. However, there may also be no clear cause. Other health problems, such as fatigue, sleep disturbance, decreased appetite, and mood changes, often accompany chronic pain. Chronic pain may limit a person's movements, which can reduce flexibility, strength, and stamina. This difficulty in carrying out important and enjoyable activities can lead to disability and despair.

NIH MedlinePlus

<https://medlineplus.gov/magazine/issues/spring11/articles/spring11pg5-6.html>

Chronic Pain

- chronic pain is one of the most common conditions encountered by humans worldwide, affecting 20% of the world's population.
- affects more than 100 million Americans at a cost of greater than \$635 billion a year.
- care over the last several decades has been largely centered on an acute care model, which has increased diagnostic-, procedural-, and analgesic-based approaches, which has not provided any population level improvement in pain or disability.
- An integrative approach...has increasing evidence for reducing pain and disability in several common pain scenarios.
- Recent guidelines, including the American College of Physicians Guidelines for low back pain, endorse the incorporation of non-pharmacologic approaches in the comprehensive management of pain.

Robert Alan Bonakdar, MD, *Integrative Pain Management*. Medical Clinics of North America, 101 (5) (Sept. 2017), pp. 987 - 1004

Chronic Pain Causes

| Nociceptive (AKA Peripheral, mechanical) | Neuropathic (AKA Mixed) | Central (AKA non-nociceptive, central sensitization) |
|---|--|--|
| Damage to peripheral tissue from injury, mechanical, metabolic or inflammatory causes | Peripheral nerve impairment due to injury, metabolic, infection or entrapment | Central disturbance in pain processing Behavioral and functional impairment may be predominant |
| Examples Osteoarthritis Rheumatoid arthritis Post surgical pain Post traumatic Cancer pain | Examples Postherpetic neuralgia Chemotherapy-induced neuropathy Diabetic neuropathy Nerve root compression | Examples Fibromyalgia Irritable bowel syndrome Chronic headache Interstitial cystitis Phantom limb pain CRPS |

Fig. 5. Categorization of pain mechanisms. AKA, also known as.

Phillips K, Clauw DJ. Central pain mechanisms in chronic pain states—maybe it is all in their head. *Best Pract Res Clin Rheumatol* 2011;25(2):141–54.

Integrative Pain Management

- Integrative pain management is a person-centered model of pain care based on the principles and practices of integrative medicine, including a focus on the restoration of function, health, and wellness.

R.A. Bonakdar, A. Sukiennik (Eds.), Integrative pain management, Well integrative medicine series (1st edition), Oxford University Press, New York (2016)

Starting Points in Addressing Chronic Pain (Teets, et al, 2010)

- Addressing the patient's pain in the context of the patient's life situation
- Ameliorating the patient's pain and/or improving quality of life
- Improving the patient's risk profile by diminishing their need for polypharmacy, invasive interventions, and unproven alternative therapies

Treatment Goals for Chronic Pain

- With chronic pain, the goal of treatment is to reduce pain and improve function, so the person can resume day-to-day activities. Patients and their healthcare providers have a number of options for the treatment of pain. Some are more effective than others. Whatever the treatment plan, it is important to remember that chronic pain usually cannot be cured, but it can be managed.

<https://medlineplus.gov/magazine/issues/spring11/articles/spring11pg5-6.html>

Dietary Modifications – Anti-Inflammatory

■ Anti-inflammatory Diets

- Favorably influence the biochemical process of inflammation present in pain syndromes
- Increased Omega-3 Fatty Acids and decreasing the Omega-6 to Omega-3 ratio in the diet
- Major Omega-3 FA available in foods
 - ALA – flax seed, canola (rapeseed) oil, soybeans, pumpkin seeds, purslane, perilla, walnuts
 - EPA – cold water fish (salmon, mackerel, halibut, sardines, herring)
 - DHA – cold water fish (salmon, mackerel, halibut, sardines, herring)
 - Doses – more than 2.7 grams daily for over 3 months

Dietary Modifications – Anti-Inflammatory

- Omega-3 FA Supplements have been shown to improve:
 - Pain
 - Joint Tenderness
 - Morning Stiffness
 - Decreasing amount of medications used
- Olive Oil
 - Doesn't contribute to Omega-6 pool
 - Contains olecanthol – blocks cyclooxygenase, similar to NSAIDs

Dietary Modifications – Anti-Inflammatory

- Decreasing the amount of meats in the diet will decrease the arachidonic acid pool.
- Fruits and Vegetables
 - Contain phytochemicals which can act as antioxidants combating oxidative stress seen in pain conditions such as osteoarthritis.

The Vegetarian and Mediterranean Diet, high in fruits, vegetables, fish and monounsaturated fats (i.e. Olive Oil), have been shown to improve pain scores

A trial of **Mediterranean Diet** or **Vegetarian Diet** can be beneficial for patients with chronic pain.

Natural Products

- Ginger (*Zingiber officinale*)
 - has been used for many years by traditional practitioners to reduce inflammation
 - research studies done on standardized extracts of the pungent ketones
 - study results have been mixed with some showing benefits
- Turmeric
 - may be beneficial in RA but in higher dosages than present in food

Natural Products

- Glucosamine Sulfate and Chondroitin
 - may be of benefit in OA in slowing the progressive changes in joint structure and controlling the progression of symptoms. Other studies have not confirmed these findings.
 - very low side-effect profile, excellent safety profile
- Avocado/Soybean Unsaponifiables
 - A mixture of 1/3 Avocado and 2/3 Soybean unsaponifiables (ASUs)
 - Studied in knee OA
 - Doses of 300 mg daily showed improvement in symptoms and decreased use of NSAIDs
 - Studies were small (n = 600 in 4 studies) but high quality

Natural Products

- MSM (methylsulfonylmethane)
 - Precursor DMSO (*dimethyl sulfoxide*)
 - Historically used for pain associated with Osteoarthritis
 - 3 high-quality studies do not support benefit in treating chronic pain from OA
 - Sometimes used as a vehicle to enhance bioavailability of other topically applied treatments that are otherwise not absorbed as easily
- Vitamin D
 - In more than 9000 participants, hypovitaminosis D was significantly associated with back pain, pain severity and higher limitations in daily activities
 - Several inflammatory cytokines improved with Vitamin D supplementation

Natural Products

- Magnesium
 - Deficiency is prevalent in several pain states and in the general population in America
 - Deficiency can be associated with inflammation
 - One trial comparing magnesium replacement to placebo found the patients receiving the supplement over 6 weeks noted reduced pain intensity and improvement in lumbar spine mobility during a 6 month follow up.
- CoQ10
 - Coenzyme q10, an antioxidant helps to reduce oxidative stress while improving pain levels
- Melatonin
 - Has central antinociceptive effects

Table 1. Dosage of selected integrative therapeutics for chronic pain.

| Therapy | Typical Daily Dosage ^a |
|------------------------|--|
| Alpha-lipoic acid | 600 mg |
| Coq10 | 100–300 mg ^b |
| Curcumin | 1–2 G |
| Magnesium | 200–600 ^c mg ^c |
| Melatonin | 3–10 mg at bedtime |
| Omega-3 (EPA/DHA) | 1–3 G |
| Vitamin D ₃ | 1000 iu ^c based on serum levels |
| Off-label medications | |
| Ketamine, intranasal | 50 mg ^c |
| LDN | 1.5–4.5 mg |

a Dosages vary based on formulation.

b Implies that dosage may increase beyond stated amount based on individual response and tolerability.

c Formulations vary and should be based on tolerability. Common formulations that may cause gastrointestinal side effects include citrate, oxide, and sulfate. Typically, chelated formulations (eg, glycinate, malate) tend to have less gastrointestinal side effects.

Exercise Based Therapies

- Physical Activity and Exercise
- Aquatic Exercises
- Mindful Exercise: tai chi and yoga
- Weight Loss

Exercise Based Therapies

- Yoga – many types, variations
 - Increases flexibility, strength, stamina
 - Increases self-awareness, emotional stability, peace of mind
 - Use of yoga asanas (Postures) increases well-being of persons with rheumatologic disease diagnosis
- Viniyoga – therapeutically oriented style
 - Slightly superior to conventional exercise and moderately superior to self-care book use
 - Decreases medications as well

Exercise Based Therapies

- **The Feldenkrais Method**
 - a type of alternative exercise therapy that proponents claim can repair impaired connections between the motor cortex and the body, so benefiting the quality of body movement and improving wellbeing. The Feldenkrais Guild of North America claims that the Feldenkrais method allows people to "rediscover [their] innate capacity for graceful, efficient movement" and that "These improvements will often generalize to enhance functioning in other aspects of [their] life". Proponents claim that the Feldenkrais Method can benefit people with a number of medical conditions, including children with autism, and people with multiple sclerosis.

https://en.wikipedia.org/wiki/Feldenkrais_Method

Mind-Body Therapies

- The connection between the mind and the body is particularly significant in treating chronic pain
- Has been shown to significantly improve quality of life in patients suffering chronic pain
- Centrally maintained pain has been correlated with cortical plasticity
 - Repeated pain input can create pain memories
 - Attentional modulations, where pain pulls attention to the painful area
 - Behavioral expectations of future pain
 - Higher levels of stress hormones, which can block plasticity (i.e. healthy adaptations)
- Excellent safety profile

Mind-Body Therapies

- CBT
 - Cognitive Behavioral Therapy
- MBSR
 - Mindfulness Based Stress Reduction
- Hypnosis
- Biofeedback

Mind-Body Therapies

- Cognitive Behavioral Therapy
 - The most commonly used behavioral treatment approach used for chronic pain
 - Overall, studies have shown small positive effects in the treatment of chronic pain, disability and mood (other behavioral therapies showed no evidence of benefit.
 - CBT alone or as part of an interdisciplinary pain rehabilitation

Mind-Body Therapies

- Hypnosis
 - Offers several approaches to pain management
 - Suggestion of anesthesia
 - Glove anesthesia
 - Pain displacement
 - Physical dissociation
 - Shown to be beneficial compared to "no treatment" in low back injuries and arthritis
 - Instruction in Self-hypnosis
 - Gives the patient a greater sense of self-control of their pain
 - The more it is used, the more benefit and longer lasting results
 - Patients can use recordings of sessions for their personal use

Mind-Body Therapies

■ Biofeedback

- Helps patients learn to control physiologic processes through monitoring and feedback of physiologic variables (i.e. heart rate, skin temperature)
- Studies using fMRI (functional MRI) show that with training, patients can voluntarily alter brain function in pain related areas
- Empowers the patient

Mind-Body Therapies

■ Meditation

- Mindful Meditation is the most widely used and studied in the treatment of chronic pain
 - A process of detached awareness, in which one allows all thoughts to enter consciousness and then lets them go without emotional attachment
- Kabat-Zinn – Founder of MBSR
 - Pain reduction with mindfulness meditation is an “uncoupling” of the physical sensation from the emotional and cognitive experience of pain

Mind-Body Therapies

■ Relaxation

- Has been shown to be beneficial for chronic pain, RA, OA, migraines, recurrent tension head aches, pain associated with child birth and during invasive medical treatments
 - Breathing Exercises
 - Guided Imagery
 - Progressive Relaxation – may be combined with guided imagery and/or meditation

Mind-Body Therapies

- Healing Touch Therapies
 - *Involve tactile contact or active guiding of somatic attention*
 - Therapeutic Touch
 - Healing touch
 - Reiki
 - Polarity treatment
 - Qi gong

Mind-Body Therapies

- Cochrane Review (2008)
 - *"Although the lack of sufficient data means that the results are inconclusive, the evidence that does exist supports the use of touch therapies in pain relief. Studies involving more experienced practitioners tend to yield greater effects in pain reduction. The studies showing the greatest effects on pain reduction were those involving highly experienced Reiki practitioners."*

Manual and Manipulative Based Therapies

- Massage, (shiatsu, acupressure, structural and relaxation) – similar, short-term benefits only
- Manipulation: Chiropractic, Osteopathic (including Craniosacral Therapy)

Manual Based Therapies

- Chiropraxy – addresses joint subluxations
 - *Biomechanical Model* – emphasizes restoring normal function of the spine
 - Active (musculotendinous)
 - Passive (ligamentous)
 - Neural Regulation (proprioceptors, nociceptors)
 - *Loss of Spinal Stability*
 - One of the three components becomes dysfunctional
 - Compensation in the other two components can trigger both movement disorder and pain provocation

Manual Based Therapies

- Osteopathic Manipulation Therapy (OMT)
 - Goal to restore proper musculoskeletal function to the body
 - Studies generally in favor for superficial heat and spinal manipulation
 - Adding OMT as adjunct treatment to traditional therapy is successful but at additional cost to the patient
- Massage Therapy
 - Soft tissue manipulation
 - Positive physiologic effects
 - Tissue repair
 - Pain modulation
 - Relaxation
 - Improved mood

Manual Based Therapies

- Massage Therapy – suggested theories for analgesic effects
 - Gate theory
 - Serotonin hypothesis
 - Restorative sleep hypothesis
 - Animal models suggest role of oxytocin
- Efficacy of Massage Therapy
 - *Cochrane Collaborative*
 - Massage alone > relaxation, acupuncture and self-care education
 - For LBP
 - Massage alone = exercises and corsets
 - Massage alone < spinal manipulation therapy
 - Massage may help with subacute/chronic LBP especially when combined with exercise and education
 - Overall cost of treatment was lower when Massage Therapy was included

Acupuncture

- A part of the larger Traditional Chinese Medicine system of healing
- Attempts to influence the life force/energy known as Qi that flows through pathways (meridians) in the body
- Achieving proper flow of Qi is believed to create health and wellness
- Studies show that acupuncture may alter brain chemistry by changing the release of neurotransmitters and neurohormones
- Functional MRI has demonstrated the neuromodulatory effect of acupuncture stimulation
- Conventional studies support its efficacy in providing some clinic improvement in LBP
 - Decreased pain (analgesic effects)
 - Increased functionality
 - Decreased use of analgesic medications
- Most likely to be most beneficial in patients with high expectations of beneficial effects
- Adverse Events are **VERY RARE**

Risk of Manual Based Therapies

- Serious Adverse Events
 - < 1 / 1,000,000 Patient Visits
- Cauda Equina Syndrome
 - < 1 / 1,000,000 to 1 / 100,000,000 Patient Visits

Self-management of Chronic Pain

- **Self-management of chronic pain holds great promise as a treatment approach.**
- In self-management programs, the individual patient becomes an active participant in his or her pain treatment—engaging in problem-solving, pacing, decision-making, and taking actions to manage their pain. Although self-management programs can differ, they have some common features. Their approach is that the person living with pain needs help learning to think, feel, and do better, despite the persistence of pain. Improving communication with the healthcare provider is part of that empowerment. Through NIH-supported research, starting successful self-management programs has reduced many barriers to effective pain management, regardless of the underlying conditions. Individuals who participate in these programs have significantly increased their ability to cope with pain. They improve their ability to be active, healthy, and involved members of their communities. In fact, new research suggests that the best self-management programs teach people different ways of thinking about and responding to pain, making their actions to relieve it more effective.

<https://medlineplus.gov/magazine/issues/spring14/articles/spring14ex5-6.html>

Low Back Pain

- Although low back pain can be categorized by many potential causes, including mechanical, inflammatory, neoplastic, and vascular, **more than 85% of cases are nonspecific**, that is, no specific underlying cause can be identified.
- Clinical guidelines for the treatment of low back pain issued in 2017 by the American College of Physicians recommend several non-pharmacologic therapies as first-line treatment.
 - *Physical Activity and Exercise*
 - *Aquatic Exercises*
 - *Mindful Exercise: tai chi and yoga*
 - *Weight Loss*
 - *Supplements: Omega 3 fatty acids, Curcumin (Turmeric), Vitamin D, Magnesium*
 - *Mind-Body Therapies: CBT, MBSR, Hypnosis, Biofeedback*
 - *Manual and Manipulation Therapies*
 - *Massage, (shiatsu, acupuncture, structural and relaxation) - similar, short-term benefits only*
 - *Manipulation: Chiropractic, Osteopathic (including Craniosacral Therapy)*

Accrediting Bodies are setting new standards in pain management

- Joint Commission announces new pain assessment and management standards
 - *Effective July 2019*
 - *Affecting behavioral health care, home care, and nursing care*

NIH Clinical Practice Guidelines

- [NSAIDs and Other Complementary Treatments for Episodic Migraine Prevention in Adults \(link is external\)](#) (Neurology) [393KB PDF]
- [Vitamin D and Calcium Supplementation to Prevent Fractures in Adults \(link is external\)](#) (U.S. Preventive Services Task Force)
- [Probiotics and Children \(link is external\)](#) (Journal of Pediatric Gastroenterology and Nutrition) [119KB PDF]
- [Complementary and Alternative Medicine in Multiple Sclerosis \(link is external\)](#) (American Academy of Neurology)
- [Use of Integrative Therapies as Supportive Care in Breast Cancer Patients \(link is external\)](#) (Journal of the National Cancer Institute) [391KB PDF]
- [Botanicals for Menopausal Symptoms](#) (Obstetrics and Gynecology)
- [Chiropractic Management of Fibromyalgia Syndrome: Summary of Clinical Practice \(link is external\)](#) (Council on Chiropractic Guidelines and Practice Parameters) [21KB PDF]

<https://ncctb.nih.gov/health/providers/clinicalpractice.htm>

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