

# Complementary and alternative medicine

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- Overview of complementary and alternative medicine 196
- Issues in cancer complementary and alternative medicine 197
- Major categories of complementary and alternative medicine therapies 198
  - Alternative medical systems 198
  - Energy therapies 198
  - Exercise therapies 199
  - Manipulative and body-based methods 199
  - Mind-body interventions 200
  - Nutritional therapeutics 201
  - Pharmacologic and biologic treatments 202
  - Spiritual therapies 203
- Further reading 204

## Overview of complementary and alternative medicine

Complementary and alternative medicine (CAM) is often defined as any medical system, practice, or product that is not thought of as standard or conventional care. Some practitioners of CAM define it as any practice falling outside “Western” or allopathic medical training.

### *Complementary medicine*

Complementary medicine is used along with standard medicine.

### *Alternative medicine*

Alternative medicine is used in place of standard treatments.

Complementary and alternative medicine may include dietary supplements, complex herbal mixtures, dietary modifications, acupuncture, massage therapy, magnet therapy, spiritual healing, and meditation.

It is crucial that CAM therapies receive the same scientific evaluation used to assess standard healthcare approaches. Because CAM therapies are proven safe and effective, they may become part of standard healthcare, particularly in supportive care.

The National Cancer Institute (NCI) has established an Office of Cancer CAM (OCCAM) that specifically addresses the use of CAM in the treatment, palliation, and prevention of cancer.

## Issues in cancer complementary and alternative medicine

Studies have reported that approximately 80% of cancer patients use some form of CAM, and more than 60% use supplements concurrent with their cancer treatment. Significant supplement-chemotherapy and supplement-radiotherapy interactions have been reported.

Multiple studies have shown that many patients (~50%) are reluctant to discuss CAM therapies with their standard healthcare teams. Few cancer CAM therapies have been tested in randomized controlled trials (RCTs).

Mass media and Internet sources for information on cancer CAM are unreliable. A recent review of breast cancer information Web sites revealed that those discussing CAM therapies were 15 times more likely to contain inaccurate information.

## Major categories of complementary and alternative medicine therapies

Major categories of CAM have been defined by the OCCAM. Multiple CAM therapies can be classified under more than one category, such as yoga, which has both an exercise and meditation component.

Therapies have been assigned to one of the three following groups:

- **Beneficial in cancer:** Effective in RCTs. No significant adverse effects have been reported.
- **Unproven benefit:** Efficacy not shown in randomized clinical trials. No significant adverse effects have been reported.
- **Potentially harmful:** Significant adverse effects have been observed. This last category can be extended to all of the practices if used solely as alternative therapy, i.e., in lieu of standard therapy.

### Alternative medical systems

Alternative medical systems are built upon complete systems of theory and practice. Often, these systems have evolved apart from and earlier than the conventional medical approach used in the United States.

#### *Beneficial in cancer*

##### *Acupuncture*

This is one of the key components of traditional Chinese medicine. Treatment typically involves stimulation of anatomical points by insertion of thin needles into the skin. Acupressure and electroacupuncture are also used.

Benefits:

- Reduction in cancer-related pain
- Reduction in chemotherapy-induced nausea

##### *Unproven benefit*

- **Ayurveda** is an ancient system of healthcare native to India. The majority of treatment is herbal, but metals and minerals may be added.
- **Homeopathy** is the use of medicine with similar side effects to the illness being treated, but at extremely high dilutions, such that less than one molecule remains.
- **Naturopathy** is the use of natural remedies for treatment. Individual components may be beneficial. Practitioners may vary widely in their training.
- **Traditional Chinese medicine (TCM)** is a very broad category, including the methods of diagnosis and treatment. Individual components have been tested and shown to be beneficial.
- **Tibetan medicine** is an ancient system of healthcare native to Tibet. The majority of treatment is herbal, but precious metals may be added.

### Energy therapies

Energy therapies involve the use of energy fields. There are two types, biofield therapies and electromagnetic-based therapies.

#### *Biofield therapies*

These are intended to affect energy fields that purportedly surround and penetrate the human body. The existence of such fields has not yet been scientifically proven.

*Unproven benefit*

- Reiki
- Therapeutic touch
- Polarity therapy

**Electromagnetic-based therapies**

These involve the unconventional use of electromagnetic fields, such as pulsed fields, magnetic fields, or alternating-current or direct-current fields.

*Unproven benefit*

- Pulsed electromagnetic fields
- Magnet therapy

**Exercise therapies**

Exercise therapies are those that involve movement, such as t'ai chi, yoga asanas, and other aerobic exercise.

*Beneficial in cancer**Physical activity*

Many forms of physical activity involving aerobic exercise have shown benefit. The amount, frequency, and intensity of activity have varied in studies. Prospective observational studies have suggested a reduction in recurrence of multiple cancers.

## Benefits:

- Reduction of therapy-related fatigue
- Improvement in quality of life indices

*Unproven benefit*

- T'ai chi chuan is a Chinese exercise form that includes relaxation, deep and regulated breathing techniques, and slow movements.
- Yoga asanas is the physical exercises of yoga practice.

**Manipulative and body-based methods**

Manipulative and body-based methods in CAM are based on manipulation and/or movement of one or more parts of the body.

*Beneficial in cancer**Therapeutic massage*

This involves the manipulation of soft tissue areas of the body. There are many different kinds of massage derived from both Western and Eastern traditions, including Swedish massage, trigger point therapy, lymphatic drainage, shiatsu, and Thai massage. Benefits include

- Reduction of chemotherapy-induced nausea and vomiting (CINV)
- Reduction in anxiety

*Unproven benefit*

- Chiropractic methods focus on disorders of the musculoskeletal system and the nervous system, and the effects of these disorders on general health. The most common procedure is the manipulation of the spine; rarely, cervical spine manipulation may result in adverse events.
- Reflexology consists of firm pressure to specific points on the feet, hands, or ears. Reflexology is based on the principle that these regions contain links that correspond to every other part of the body.

## Mind-body interventions

Mind-body medicine involves a variety of techniques designed to enhance the mind's capacity to affect bodily function and symptoms.

### *Beneficial in cancer*

#### *Meditation*

Most trials have investigated mindfulness-based stress reduction (MBSR), which is a combination of mindfulness meditation—being “in the moment”—and yoga practices. There are numerous other forms of meditation, falling into either concentrative or mindfulness practices. Concentrative meditation focuses on clearing the mind and focusing on a single object, whereas mindfulness meditation involves close attention to physical and mental experiences.

Benefits:

- Reduction in mood disturbances
- Reduction in stress
- Improvement in sleep quality
- Reduction in fatigue
- Decreased blood pressure

#### *Relaxation and guided imagery*

This consists of progressive body relaxation and/or guided imagery. Typically, a tape will be used that gives direction on relaxation of parts of the body and/or imagination of being in a peaceful place.

Benefits:

- Reduction in anxiety and depression
- Reduction in CIMV
- Reduction in anticipatory nausea and vomiting
- Reduction in fatigue
- Decreased blood pressure

#### *Yoga*

Yoga is collection of spiritual techniques and practices aimed at integrating the mind, body, and spirit. There are many different yoga traditions. Those used in the West derive from the ancient Indian Hatha yoga, incorporating stretches and poses, breathing exercises, and meditation. Yoga tested in cancer clinical trials has generally been modified for use by cancer patients.

Benefits:

- Reduction in fatigue
- Reduction in mental distress
- Improvement in sleep

#### *Art therapy*

This is a form of expressive therapy using art materials. Benefits include

- Improvement in coping resources
- Improved health-related quality of life

#### *Music therapy*

This is a form of therapy using active music participation or passive listening. Benefits include

- Decreased mood disturbance
- Improved quality of life



*Unproven benefit*

- Aromatherapy is the use of aromatic essential oils in inhalation or massage settings.
- Support groups

**Nutritional therapeutics**

This involves an assortment of nutrients and non-nutrients, bioactive food components used as chemopreventive agents, and the use of specific foods or diets as cancer prevention or treatment strategies.

*Beneficial in cancer*

- Vitamin D plus calcium reduces the risk of breast cancer.
- Acetyl-L-carnitine reduces neuropathy due to taxanes and platinum.
- A low-fat diet reduces ovarian cancer risk and breast cancer recurrence.

*Significant in prospective cohort studies*

A number of dietary factors have been shown to influence the risk of cancer in prospective cohort studies. Some factors, such as alcohol consumption, cannot be tested in an RCT.

- Reduced alcohol intake
- Increased dietary lignan intake
- Reduced fat intake
- Decreased red meat intake
- Decreased processed meat intake

*Unproven benefit*

- Macrobiotic diet
- High fruit and vegetable diet
- Orthomolecular medicine
- Indole-3-carbinol (I3C)/3,3'-diindolylmethane (DIM)
- Selenium
- Coenzyme Q10
- Vitamin D
- Vitamin C
- Flaxseed

*Potentially harmful*

- **Gerson therapy** consists of a strict low-sodium diet, consumption of large amounts of juice from fruits, vegetables, and calf liver, and frequent coffee enemas. No credible cancer cures have resulted from this therapy, and deaths from the therapy have been reported.
- **Gonzalez regimen** combines prescribed diets, nutritional supplements, pig pancreatic enzymes, and twice-daily coffee enemas. Frequent enemas can cause significant electrolyte abnormalities.
- **Soy phytoestrogens:** Isoflavones in soy bind weakly to the estrogen receptor, potentially causing growth in estrogen-dependent cancers.
- **Vitamin E/ $\alpha$ -tocopherol supplements** may increase risk of cancer development and impair efficacy of chemotherapy and radiation therapy.
- **Vitamin A/ $\beta$ -carotene supplements** may increase risk of cancer development and impair efficacy of chemotherapy and radiation therapy.

### Pharmacologic and biologic treatments

Such treatments include off-label use of prescription drugs, hormones, complex natural products, vaccines, and other biological interventions not yet accepted in mainstream medicine.

#### *Beneficial in cancer*

- **Melatonin:** Prolonged survival after whole-brain radiation for brain metastases from solid tumors.

#### *Unproven benefit*

- **Immunoaugmentative therapy (IAT)** involves use of injections of unknown proteins derived from human blood. There is no scientific evidence that it treats or cures cancer. In the 1980s, patients were reported with serious infections; none have been publicly reported since then.
- **Low-dose naltrexone:** Use of naltrexone at approximately one-tenth the therapeutic dose to augment the immune system
- **714X** is an injected medication that contains nitrogen as its primary ingredient, camphor as its vehicle, mineral salts, and 18 trace elements. No evidence exists that it can treat or cure cancer. Importation to the United States is illegal.

#### *Potentially harmful*

- **Laetrile** is a purified form of the chemical amygdalin, found in many fruit pits. Side effects resemble those of cyanide poisoning.
- **Chelation therapy:** Disodium EDTA chelation therapy (oral or IV) has caused deaths from hypocalcemia. Renal failure and bone marrow toxicity have also resulted.
- **Hydrazine sulfate** has not proven effective in RCTs, and use may result in significant neurological side effects.
- **Dichloroacetic acid (DCA)** is a potent reducer of lactic acid but causes peripheral neuropathy and hepatotoxicity in adults.
- **Antineoplastons** are a mixture of amino acid derivatives, peptides, and amino acids found in human blood and urine. Severe neurotoxic side effects have been reported.

### Subcategory: complex natural products

These remedies are derived from plants, fungi, other microorganisms, animal tissues, or marine organisms used for healing and treatment of disease. Products range from dried and pulverized material to crude, unfractionated organic extracts, and semipurified extract fractions. As the name implies, complex natural products contain dozens or hundreds of chemical compounds, in contrast to single-agent natural-product therapeutics such as paclitaxel or doxorubicin. Many of the products listed under “Unproven benefit” have shown promising results in preclinical cancer studies and are undergoing further investigation.

#### *Beneficial in cancer*

- ***Lactobacillus* sp/probiotic supplements** reduce 5-FU-induced diarrhea and radiation-induced diarrhea. Patients with immunosuppression are excluded from trials.



**Unproven benefit (most commonly used, not a comprehensive list)**

- Mistletoe (*Viscum album*) (Iscador, Helixor)
- Shark cartilage
- Noni juice (*Morinda citrifolia*)
- Milk thistle (*Silybum marianum*)
- Curcumin or turmeric (*Curcuma longa*)
- Fermented wheat germ (Aveamar)
- MGN-3 is an extract of arabinoxylan from rice bran.
- Green tea or epigallocatechin-3-gallate (EGCG)
- Black cohosh (*Actea racemosa*)
- Garlic (*Allium sativum*)
- Ginger (*Zingiber officinale*)
- Ginkgo (*Ginkgo biloba*)

**Potentially harmful**

- **Red clover** (*Trifolium pratense*) is found in numerous herbal blends. It contains phytoestrogens that may increase growth of estrogen-dependent cancers.
- **Essiac** is a combination of several herbs, usually taken as a tea. One common component is red clover. There is no proven benefit in treating cancer.
- **Hoxsey therapy** is use of an herbal mixture internally and externally in combination with diet restrictions. Illegal in the United States, the internal tonic contains pokeweed, burdock root, licorice, barberry, buckthorn bark, stillingia root, red clover, prickly ash bark, potassium iodide, cascara, and sometimes other ingredients. Side effects include nausea, vomiting, and diarrhea.
- **St. John's wort** (*Hypericum perforatum*) is a potent inducer of CYP3A4, which is responsible for metabolizing 50% of prescription drugs. Its induction increases the drugs' clearance (and decreases their effectiveness). CYP3A4 metabolizes many chemotherapeutic drugs, including paclitaxel, etoposide, vinorelbine, imatinib, ifosfamide, and others.

**Spiritual therapies**

Such therapies have to do with deep, often religious, feelings and beliefs, including a person's sense of peace, purpose, connection to others, and beliefs about the meaning of life.

**Unproven benefit**

- Intercessory prayer
- Spiritual healing

## Further reading

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