Acknowledgements

RN.com acknowledges the valuable contributions of...

...Lindsey Ryan, MSN, RN, ACNS-BC

Conflict of Interest and Commercial Support
RN.com strives to present content in a fair and unbiased manner at all times, and has a full and fair disclosure policy that requires course faculty to declare any real or apparent commercial affiliation related to the content of this presentation. Note: Conflict of interest is defined by ANCC as a situation in which an individual has an opportunity to affect educational content about products or services of a commercial interest with which he/she has a financial relationship.

The author of this course does not have any conflict of interest to declare.

The planners of the educational activity have no conflicts of interest to disclose.

There is no commercial support being used for this course.

Purpose
The purpose of this three-hour presentation on complementary and alternative medicine (CAM) is to provide the healthcare professional with a high-level overview of available CAM therapies to promote and maintain optimal well-being.

Learning Objectives
After successful completion of this continuing education course, participants will be able to:

1. Differentiate between complementary, alternative, and integrative medicine.
2. Explain the history of the emerging and popularity of CAM in the United States.
3. Explain the patterns of use in the United States among different age groups and conditions.
4. Give examples of current uses for the complementary and alternative medical therapies described in the course.
5. Identify side effects and cautions associated with the complementary and alternative medical therapies described in the course.
6. Describe current research findings for the complementary and alternative medical practices described in the course.
What is Complementary and Alternative Medicine (CAM)?
The National Center for Complementary and Alternative Medicine (2017a) defines CAM as a group of diverse medical and healthcare systems, practices, and products that are not generally considered part of conventional medicine. Conventional medicine (also called Western, traditional or allopathic medicine) is medicine as practiced by holders of medical doctor (M.D.) and doctor of osteopathic medicine (D.O.) degrees and by allied health professionals, such as physical therapists, psychologists, and registered nurses.

The boundaries between CAM and conventional medicine are now shifting. Specific CAM practices may, over time, become widely accepted.

Introduction to CAM
The World Health Organization (2017) defines health as, “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” CAM itself is an arrangement of activities and interventions that focus on the physical, mental, spiritual, and emotional aspects of one's life.

Many people use CAM approaches to improve their health, as a healthy lifestyle can enhance wellness and prevent illness, or disease. Increased interest in CAM presents many new and exciting opportunities for healthcare.

CAM Terminology
What does complementary, alternative and integrative mean exactly?
The approach to the utilization of CAM therapies can vary. (NCCIH, 2016)

- Complementary is the use of CAM together with conventional medicine
- Alternative is the use of CAM in place of conventional medicine
- Integrative is the incorporation of CAM into mainstream health care

Reflection:
- What does health mean to you?
- How do you, as a healthcare provider, honor your patient’s value of health?

The Challenge
Why is it so difficult to integrate CAM into conventional medicine? Here are four possible reasons:

1. Many CAM approaches still lack an adequate scientific basis.
2. Delivery of CAM in a conventional healthcare setting often requires substantial redesign of the way both the conventional and CAM healthcare services are structured, conceptualized, and delivered.
3. Many CAM practitioners believe they would have to dramatically alter or water down their approach to practice in order to adapt to a physician-dominated system.
4. Some CAM professionals prefer not to integrate if it means giving up their identity and independence.

(Gale, 2014; IOM, 2005)

Reflection:
• What challenges would occur in your specialty if a CAM modality was integrated into the protocol?
• How might those challenges be turned into opportunities?

CAM Practitioner Similarities
Each CAM modality or system has its own distinctive therapies and theories. However, all share a common philosophy based off the following principles:

• Natural healing supports and stimulates the body’s own innate healing power.
• Holistic care attends to the mental, emotional and spiritual elements of illness as well as the physical components of disease.
• Practice is rooted in clinical experience.

(Cuellar, 2006)

CAM Practitioner Similarities
Despite the diversity, there are common threads that run among many conventional systems of healthcare as well as systems that have re-emerged more recently. These similarities include:

• Whole systems
• The promotion of self-care
• The stimulation of self-healing processes
• The integration of mind and body
• The spiritual nature of illness and healing
• The prevention of illness by enhancing the vital energy or subtle forces in the body

Test Yourself
Please match the correct definition below to the following options:

A. Complementary
B. Alternative
C. Integrative

Answer Options:
1. Use of CAM in place of conventional medicine.
2. Use of CAM together with conventional medicine.
3. Combines treatments from conventional medicine and CAM for which there is some form of high-quality evidence of safety and effectiveness.

The correct answers are as follows; A=2, B=1, C=3

In the Beginning: American Healthcare

Early 19th Century:
Primary medical care was provided by botanical healers, midwives, chiropractors, homeopaths, and an assortment of other lay healers offering a variety herbs and nostrums for a range of illnesses.

Late 19th Century: The Germ Theory
Significant scientific advances in antiseptic techniques, anesthesia, and surgery coincided with the major revolution in medical education, advanced scientific medicine into the dominant healthcare system.

1892:
William Osler published the textbook, The Principles and Practice of Medicine, which brought diagnostic clarity to medical practice.

1905:
Osler's textbook became the primary medical textbook in the majority of U.S. medical schools.

1910:
After the release of the Flexner report, many medical institutions that did not meet its standards were driven out of business or forced to implement significantly more rigorous training programs. Schools for many unorthodox healing systems either ceased to exist or became marginalized.

Note! The Flexner report (also called Carnegie Foundation Bulletin Number Four) called on American medical schools to enact higher admission and graduation standards, and to adhere strictly to the protocols of mainstream science in their teaching and research.

Early-to-Mid 20th Century: The Medical Education Evolution
Life-saving hormones, sulfa drugs, and other antibiotics cemented conventional medicine's place as the nation's preeminent form of healthcare in this country. Although most of the other healthcare systems and their therapies did not disappear, they were considered by most to be unscientific relics of the past. As a result, many practiced in relative obscurity.

With the reduced threat of infectious diseases and other acute illnesses, conventional medicine focused on the more complex and costly problems of chronic, degenerative illnesses. As a result
of public health interventions developed earlier in the 20th century, people began living significantly longer. This gradual aging of the population increased the prevalence of chronic conditions, such as arthritis, back pain, diabetes, hypertension, heart disease, and cancer, putting further pressure on conventional medicine to address these conditions.

1950’s: Whole foods and Dietary Supplement Movement
Americans began to see food not only as something they needed to stay alive, but also as a potential therapeutic agent.

1965-1975:
Sophisticated means of diagnosing and managing chronic illnesses tripled the national healthcare expenditures and doubled out-of-pocket expenditures. Costs continued to rise.

1971:
New York Times writer James Reston had an emergency appendectomy in a Chinese hospital. His article describing his relief of post-operative pain by acupuncture and herbs was for most Americans their first glimpse of traditional Chinese medicine and its potential uses.

Early to mid 1970’s: “Counterculture” Movement
- Fascination with the religious and philosophical traditions of Asian cultures.
- Transcendental meditation became widely known and practiced.
- Growing interest in indigenous healthcare traditions, such as Native American and Mexican-American healthcare practices, particularly their reliance on herbs and natural substances.

Late 1970’s: Holistic Healthcare Movement
- Holistic practice (holism comes from the Greek word "holos" or "whole") emphasized an attention to the whole person, including the physical, spiritual, psychological, and ecological dimensions of healing. Holistic healthcare incorporates practices and concepts of Eastern philosophy and diverse cultural traditions, including acupuncture and the use of herbs, massage, and relaxation techniques as well as conventional medical practices. It gained its greatest following among nurses. However, many physicians, particularly those in the new specialty of family medicine, also became interested in this movement.
  - The American Holistic Medical and Nurses Association formed holding large, professional and public conferences.
  - Holistic medical clinics and health centers opened.

Late 1970’s to Early 1980’s: Self-Care Movement
Programs or events offered to help individuals and families increase wellness or reduce their risk of onset of illness through diet or lifestyle changes became popular.

1980’s: Personal Fitness Movement
The use of the techniques of other systems of healing, such as yoga, tai chi, and massage awakened.

**The White House Commission on CAM Policy**

The White House Commission on Complementary and Alternative Medicine Policy was established in March 2000 to address issues related to:

- Access and delivery of CAM
- Priorities for research
- The need for better education of consumers and healthcare professionals about CAM
- Legislative and administrative recommendations for ensuring that public policy maximizes the potential benefits of CAM therapies to consumers

(White House Commission on Complementary and Alternative Medicine Policy, 2002)

**Ten Guiding Principles**

The commission endorsed ten guiding principles to shape the process of making recommendations and to focus the recommendations themselves:

1. **A wholeness orientation in healthcare delivery** to support high-quality healthcare of the whole person as health involves mind, body, spirit, and environment.
2. **Evidence of safety and efficacy** to promote the use of appropriate scientific methods to help identify safe and effective CAM services and products.
3. **The healing capacity of the person** to support and promote people’s remarkable capacity for recovery and self-healing.
4. **Respect for individual** preferences and preserve dignity as each person is unique and has the right to healthcare that is appropriately responsive to him or her.
5. **The right to choose treatment** among safe and effective care or approaches, as well as among qualified practitioners.
6. **Emphasis on health promotion and care** to emphasize self-care and early intervention.
7. **Partnerships as essential to integrative healthcare** to create optimal healing environments and to respect the diversity of all healthcare traditions.
8. **Education as a fundamental healthcare service** to provide education about prevention, healthy lifestyles, and the power of self-healing.
9. **Dissemination of comprehensive and timely information** to promote efforts that examine the evidence on which CAM systems, practices, and products are based.
10. **Integral public involvement** to incorporate input of informed consumers in setting priorities for healthcare, healthcare research, and policy decisions.

(White House Commission on Complementary and Alternative Medicine Policy, 2002)

**Safety and Efficacy**

The National Center for Complementary and Integrative Health (NCCIH) is the Federal Government’s lead agency for scientific research on complementary and integrative health approaches.
The NCCIH (2017b) is one of 27 institutes and centers that make up the National Institutes of Health (NIH) within the U.S. Department of Health and Human Services (DHHS).

**NCCIH Overview**

**Mission**
The NCCIH was founded in 1998 and was originally known as the National Center for Complementary and Alternative Medicine (NCCAM) before transitioning to the NCCIH in 2015. The NCCIH received $130.5 million dollars in funding during 2017. NCCIH’s mission is to define, through rigorous scientific investigation, the usefulness and safety of complementary and integrative health interventions and their roles in improving health and health care.

**Strategic Objectives**
- Advance fundamental science and methods development.
- Improve care for hard-to-manage symptoms.
- Foster health promotion and disease prevention
- Enhance the complementary and integrative health research workforce.
- Disseminate objective evidence-based information on complementary and integrative health interventions.

(NCCIH, 2017b)

**CAM and the Scientific Evidence**
NCCIH’s scientific evidence on CAM therapies includes results from laboratory research as well as clinic trials. It encompasses both “positive” findings (the therapy may work) and “negative” findings (the therapy probably does not work or may be unsafe). However, even when evidence indicates that a particular CAM approach is safe and effective for a certain condition, safety concerns may arise when it is used in conjunction with conventional medications.

Surveys indicate that those with the most serious and debilitating medical conditions, such as cancer, chronic pain, and HIV, tend to be the most frequent users of CAM practices. Physicians, hospitals, and other conventional healthcare organizations also are showing a growing interest in CAM. This suggests that those with chronic conditions and the physicians who treat them are looking for more therapeutic options than are widely available in conventional healthcare settings (Patel, Kemper & Kitzmiller, 2017).

**Expanding the Use of CAM Therapies**
For some chronic conditions, state-of-the-art conventional therapies have provided only modest gains. For example, according to a number of assessments over the years, expensive mainstream healthcare approaches to managing chronic lower back pain often have not been very effective. This is perhaps why individuals with back pain are some of the most frequent
users of CAM practices (White House Commission on Complementary and Alternative Medicine Policy, 2002, pg. 46).

What is Motivating CAM Users?
What motivates a person to consider CAM therapy/therapies?

Advantages:
- Perceived effectiveness
- Perceived safety
- Philosophical congruence:
  - Spiritual dimension
  - Emphasis on holism
  - Embracing all things natural
  - Active role of patient
  - Explanations intuitively acceptable
- Control over treatment
- High level of touch and interaction, low use of technology
- Good patient-therapist relationship:
  - Enough time available
  - On equal terms
  - Emotional factors
  - Empathy
- Non-invasive nature
- Accessibility
- Pleasant therapeutic experience

Disadvantages:
- Dissatisfaction with conventional healthcare:
  - Too focused on curing disease rather than maintaining good health
  - Ineffective for certain conditions
  - Too expensive
  - Serious adverse effects
  - Poor doctor-patient relationship
  - Insufficient time with doctor
  - Waiting lists
  - High use of technology, low use of touch and interaction
  - Desperation

What is Motivating CAM Users?
There are many reasons why one may choose a CAM therapy:
- CAM therapy is regarded as more natural and effective, and it allows a more active role for them
- Failure of orthodox medicine to provide relief
- Adverse effects of orthodox medicine
Positive patient-practitioner relationship  
(Furnham, 2015)

Reflection:
- Have you considered CAM therapies?
- If you currently use CAM therapy, what motivates you to do so?

Demographics and Cost
The 2007 NHIS (National Health Interview Survey) CAM Survey reveals the demographics and cost of CAM:
- 38% (4 in 10) of adults and 12% (1 in 9) of children use some form of CAM
- CAM is widespread in all demographic groups
- Women use CAM more than men
- Regionally, higher utilization in the West (in state of Washington, legislation has mandated coverage of chiropractic, massage, and acupuncture in all insurance plans offered) than in the Midwest, Northeast, or in the South
- Greater use of CAM in people with higher education levels
- Largely paid for out-of-pocket
- Cost approximately 34 billion, 1% of healthcare expenditures, 10% of out-of-pocket costs

![CAM Use by U.S. Adults and Children](image)

(Barnes, Bloom, Nahin, 2008)
Which CAM Therapies are the Most Commonly Used?
CAM therapies most commonly used by adults in the past 12 months, 2007:

- Non-vitamin, non-mineral, natural products (17.7%)
- Deep breathing exercises (12.7%)
- Meditation (9.4%)
- Chiropractic or osteopathic manipulation (8.6%)
- Massage (8.3%)
- Yoga (6.1%)

Therapies showing increase in utilization for adults 2002 vs. 2007:

- Deep breathing exercise
- Meditation
- Yoga
- Acupuncture
- Massage therapy
- Naturopathy

Most commonly used natural products by adults, 2007:

- Fish oil/Omega-3/DHA 37.4%
- Glucosamine 19.9%
- Echinacea 19.8%
- Flaxseed oil or pills 15.9%
- Ginseng 14.1%
What Diseases and Conditions are People Using CAM for?
In 2007, adults used CAM most often to treat a variety of musculoskeletal problems including:
- Back pain (17.1%)
- Neck pain (5.9%)
- Joint pain or stiffness (5.2%)
- Arthritis (3.5%)
- Other musculoskeletal conditions (1.8%)

![Graph showing CAM utilization for different conditions](image)

(Barnes, Bloom, Nahin, 2008)

What Other Changes Have Occurred in CAM Utilization from 2002-2007?
The use of CAM therapies for head or chest colds shows a marked decrease from 2002-2007 (9.5% to 2.0%).

A smaller decrease in use is seen for stomach or intestinal illness and anxiety or depression and a small increase in CAM use for treatment of cholesterol problems.
CAM Utilization in Children: Girls versus Boys

Approximately one in nine children (11.8%) used some type of CAM therapy.

**CAM therapies most commonly used:**
- Non-vitamin, non-mineral, natural products (3.9%)
- Chiropractic or osteopathic manipulation (2.8%)
- Deep breathing exercises (2.2%)
- Yoga (2.1%)
- Homeopathic treatment (1.3%)

**CAM therapies used most often for:**
- Back or neck pain (6.7%)
- Head or chest colds (6.6%)
- Anxiety or stress (4.8%)
- Other musculoskeletal problems (4.2%)
- ADHD/ADD (2.5%)

Girls were no more likely than boys to use some type of CAM therapy. However, girls (4.9%) were more likely than boys (3.8%) to use mind-body therapies. CAM use was more likely among adolescents age 12-17 years (16.4%) than younger children age 5-11 years. CAM was positively associated with number of health conditions and doctor visits in the past 12 months.
CAM Therapies and Oncology Clinical Trials

A survey of almost 2,000 tumor registry patients selected at random found that 75% had used at least one CAM modality. The most frequently used therapies among this group of cancer patients were:

- Nutritional approaches (63%)
- Massage (53%)
- Herbs (44%)

73% used CAM to "stimulate an immune response". Breast cancer patients were significantly more likely to be consistent users of CAM therapies compared to patients with tumors in other sites areas of the body (84% versus 66%, respectively).

63% of cancer patients enrolled in clinical trials at the National Institutes of Health used at least one CAM therapy, with an average use of two therapies per person. The most frequently utilized therapies were:

- Spiritual approaches
- Relaxation
- Imagery
- Exercise
- Lifestyle

(Barnes, Bloom, Nahin, 2008)
• Diet (e.g., macrobiotic, vegetarian)
• Nutritional supplementation therapies

**CAM Therapies for Cancer**
Patients unanimously believed that these CAM treatments helped to improve their quality of life by helping them cope more effectively with stress, decreasing their discomforts related to treatment and the illness itself, and giving them a better sense of control.

A similar pattern of CAM usage has been found among men with prostate cancer, with 42% of those surveyed using vitamins, prayer or religious practices, and herbs to treat their condition. Most of the men in this survey did not report their use of CAM to their physicians.

**CAM for Chronic Pain**
The CAM therapies preferred for chronic pain are massage, chiropractic, and acupuncture. Back problems are the most common chronic medical condition (24%) for use of CAM treatments.

- One-third of all patients suffering from back pain choose chiropractors over physicians to treat them.
- Chiropractors provided 4% of primary care for back pain.
- Chiropractors retained a greater proportion of their patients (92%) for subsequent episodes of back pain care than did other providers. (Astin, 1998)

In 2017, an American College of Physician Clinical Practice Guideline was published outlining the effectiveness of non-pharmacologic therapies in treating low back pain (LBP) (Chou, et al., 2017):

<table>
<thead>
<tr>
<th>No Effect on LBP</th>
<th>Small Effect on LBP</th>
<th>Moderate Effect on LBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Massage</td>
<td>Exercise</td>
<td>Tai Chi</td>
</tr>
<tr>
<td>Spinal Manipulation*</td>
<td>Mindfulness</td>
<td>Yoga*</td>
</tr>
<tr>
<td></td>
<td>Operant Therapies</td>
<td>Progressive Relaxation</td>
</tr>
<tr>
<td></td>
<td>Spinal Manipulation*</td>
<td>Biofeedback</td>
</tr>
<tr>
<td></td>
<td>Yoga*</td>
<td>Cognitive Behavior Therapy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multidisciplinary Rehabilitation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acupuncture</td>
</tr>
</tbody>
</table>

*=Therapy had more than one effect size based on various comparisons and study results

**Most Common Use of CAM Therapies**
Middle-age women with higher education were found to use CAM therapies most frequently. CAM practitioners and products were chosen more often than conventional physicians and therapies by those persons suffering from:

- Arthritis
- Anxiety or Depression
Cancer
Diabetes
Chronic Conditions

(Bishop & Lewith, 2010)

What are the Statistics on CAM and HIV?

Survey of 343 HIV-infected people:

- CAM was used by 113 (32.8%), but <1% informed their health care providers of CAM usage.
- Medicinal herbs were the most common type of CAM used ($n = 110, 97.3\%$) followed by spiritual therapy ($n = 56, 49.6\%$), including faith healing/prayer and meditation.
- The most used medicinal herbs were *Aloe vera* ($n = 54, 49.1\%$), ginger ($n = 33, 30.0\%$), and garlic ($n = 23, 20.9\%$).
- The most used vitamins were complex B vitamins ($n = 70, 61.9\%$), followed by vitamin A ($n = 58, 51.3\%$), vitamin E ($n = 51, 45.1\%$), and vitamin D ($n = 42, 37.1\%$).
- Most CAM users continued using conventional medicine in addition to CAM and were willing to use CAM without supervision and without informing their health care provider.
- Patients were generally satisfied with CAM therapy ($n = 91, 80.5\%$).
- The main reasons for CAM use were the desire to take control of their treatment (8.8%) or just trying anything that could help (18.8%).
- Main influences were the mass media (32.7%) and non-hospital health personnel (19.5%).
- Predictors of CAM use were being 30-50 years, married and having a secondary school education.

(Bahall, 2017)

**Test Yourself**

Please select the positive motivations for the use of CAM from the following options:

A. High technology
B. Holism
C. Control over treatment
D. Perceived effectiveness
E. Perceived safety

All of the above are correct, except for high technology.
What are the Most Commonly Used Therapies?

<table>
<thead>
<tr>
<th>Acupuncture*</th>
<th>Energy healing therapy/Reiki*</th>
<th>Natural products (herbs and other products from plants, enzymes, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayurveda*</td>
<td>Guided imagery</td>
<td>Naturopathy*</td>
</tr>
<tr>
<td>Biofeedback*</td>
<td>Homeopathy*</td>
<td>Progressive relaxation</td>
</tr>
<tr>
<td>Chelation therapy*</td>
<td>Hypnosis*</td>
<td>Qigong</td>
</tr>
<tr>
<td>Chiropractic or osteopathic manipulation*</td>
<td>Massage*</td>
<td>Tai chi</td>
</tr>
<tr>
<td>Deep breathing exercises</td>
<td>Meditation</td>
<td>Traditional healers*</td>
</tr>
<tr>
<td>Diet-based therapies</td>
<td>Movement therapies</td>
<td>Yoga</td>
</tr>
</tbody>
</table>

(* indicates a practitioner-based therapy)

CAM Therapies Used Included in This Course

This course will cover the following CAM therapies:

<table>
<thead>
<tr>
<th>Biologically-Based Therapies</th>
<th>Mind-Body Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbal</td>
<td>Yoga</td>
</tr>
<tr>
<td>Aromatherapy</td>
<td>Meditation/guided imagery</td>
</tr>
<tr>
<td>Nutritional supplements</td>
<td>Hypnosis</td>
</tr>
</tbody>
</table>

Biologically-Based Therapies: A Little History

- Over 5000 years ago, the Sumerians described some of the medicinal uses of plants.
- 2700 B.C., the Hung Dynasty’s herbal book listed 365 medicinal plants.
- 1900 B.C., In India, Ayurveda medicine used many herbs including the use of tumeric.
- 1700 B.C., The Ebers Papyrus, an Egyptian Medical Document recorded 800 medicinal herbs including medicine, cosmetics, aromatics, cooking, fumigating, and embalming.
- 1000 B.C, Egyptian medicine used garlic, opium, castor oil, coriander, mind indigo, and other herbs.
• The Old Testament mentioned herbs as mandrake, vetch, caraway, wheat, barley, and rye.
• 9th century medieval Islamic world, medical schools began to appear and Ibn-al-Bitar, a Muslim scientist, described more than 1400 different plants which allowed the study of material medica to evolve into the science of pharmacology.


Test Yourself

1900 B.C., in India, Ayurveda medicine uses many herbs including the use of:
  A. Tumeric
  B. Wine
  C. Salt

The correct answer is A: turmeric.

Complex Entities

Unlike conventional drugs, herbal products are complex entities that contain both therapeutic and non-therapeutic ingredients. Their chemical composition is complex and naturally variable. Mixtures further complicate the picture. Additionally, there are few standards concerning the quality of the products used.

Drug Interactions with Complex Entities

Compared with drug-drug interactions, reports of drug-herb interactions are scarce. This may be due to several factors:
  • Herbs have lower pharmacological activity than drugs and thus less interaction occur.
  • Research and reporting of adverse effects of natural remedies is lacking.

In recent years there has been increased reporting on actual and potential drug-herb and drug-supplement interactions due to increased vigilance and reporting as well as the large increase in public use of herbal and dietary supplementation.
Herbal Biologically-Based Therapies Come in a Variety of Formulas

- Tinctures: Alcoholic extracts of herbs obtained by 100% ethanol or ethanol mixed with water.
- Herbal wine and elixirs: Alcoholic extract of herbs 12-38%. Herbal wine is maceration of herbs in wine and elixir is maceration in alcohol.
- Tisanes: Hot water extracts (teas).
- Decoctions: Long-term boiled extracts as roots or bark.
- Macerates: Cold infusion of plants with high mucilage content as sage, thyme, etc. The plant area is chopped and added to cold water and left to stand for 7-12 hours.
- Vinegars: Prepared the same way as tinctures except using a solution of acetic acid as the solvent.
- Other: Essential oils, balms, creams, and lotions.

A Closer Look at Herbs

Aloe (Aloe Barbadensis)

Also known as aloe vera, burn plant and lily of the desert.

Aloe was known as the “plant of immortality” in early Egypt and was presented as a burial gift to pharaohs. Aloe was also used as a topical application to heal wounds and other skin conditions and taken orally as a laxative.

Today, aloe is used for:
- Diabetes
- Asthma
- Epilepsy
- Osteoarthritis
- Burns and sunburns
- Eczema
- Insect bites
- Inflammation

The side effects of aloe can be abdominal cramps, diarrhea, and low blood glucose levels. Aloe can decrease absorption of many drugs (diarrhea caused by laxative effect) and taking aloe by mouth in combination with glucose-lowering medications should be done so with caution.

Scientific evidence shows that topical aloe gel may help heal burns and abrasions but inhibits healing of deep surgical wounds.
Astralagus (*Astragalus Membranaceus* and *Astragalus Mongholicus*)

Also known as Bei qi, huang qi, ogi, hwanggi, and milk vetch.

Astralagus has been used for centuries in Chinese medicine to restore yin-yang balance (the two complementary forces that make up all aspects and phenomena of life) and in combination with other herbs to support and enhance the immune system.

Today, astragalus is used for:
- Common colds and upper respiratory infections
- Hepatitis
- Cancer
- Cardiovascular disease

Astralagus may interact with medicines that suppress the immune system like the drug cyclophosphamide taken by cancer patients and similar drugs taken by organ transplant recipients. Using U.S. astragalus species such as “locoweed”, may have different effects and side effects, should be avoided.

Scientific evidence:
- May benefit heart function and immune system
- Potential benefits in combination with glossy privet as an adjunctive therapy for cancer
Researchers are currently studying astragalus’ effects on the immune system.


**Bilberry (Vaccinium Myrtillus)**

Also known as European blueberry, whortleberry, and huckleberry.

Bilberry, which closely resembles its relative the blueberry, grows in North America, Europe, and northern Asia. It has been used for 1,000 years in traditional European medicine to treat diarrhea and scurvy.

Bilberry is used today for:
- Diarrhea
- Menstrual cramps
- Eye conditions
- Varicose veins
- Venous insufficiency
- Other circulatory conditions

High doses of bilberry leaf or leaf extract are considered unsafe due to possible toxic side effects.

Individuals claim improvement in night vision from the use of bilberry, but studies have not shown this to be true.

Bitter Orange (*Citrus Aurantium*)

Also known as seville orange, sour orange, and zhi shi.

Bitter orange, a native tree in Africa and tropical Asia, is grown today in the Mediterranean region, California, and Florida. Bitter orange was historically used for nausea, indigestion, and constipation.

Today’s uses include:
- Heartburn
- Loss of appetite
- Nasal congestion
- Weight loss
- Fungal infections

Many weight-loss products contain bitter orange in place of ephedra.

Avoid taking bitter orange in the following conditions:
- Heart disease or hypertension
- Use of medications (such as MAO inhibitors), caffeine or other herbs/supplements that speed up the heart rate
- Pregnancy (lack of safety evidence)

Bitter orange oil used on the skin may increase the risk of sunburn, particularly in light-skinned people.

Bitter orange contains synephrine. Synephrine is a compound similar to ephedrine, which the FDA banned in 2004 because it raises blood pressure and is linked to heart attacks and strokes. It is unclear whether bitter orange has similar effects.

Black Cohosh (*Actaea Racemosa, Comicifuga Racemosa*)

Also known as black snakeroot, macrotys, bugbane, bugwort, rattleroot, and rattleweed.

Black cohosh, a member of the buttercup family, is native to North America and used in Native American Medicine for the treatment of rheumatism, general weakness, and uterine disorders.

Black cohosh is used today for:
- Hot flashes
- Night sweats
- Vaginal dryness
- Menstrual irregularities
- Premenstrual syndrome
- Labor induction

Side effects of black cohosh are headaches and stomach discomfort. There have been several reports of hepatitis and liver failure in women, but it is not known if black cohosh is responsible for the liver failure. Nonetheless, individuals with liver disease or its symptoms of abdominal pain, dark urine or jaundice should avoid black cohosh.

Study results are mixed on whether black cohosh effectively relieves menopausal symptoms. Researchers continue to study the potential effects of black cohosh on hot flashes and other menopausal symptoms.

Cat’s Claw (*Uncaria Tomentosa, Uncaria Guianensis*)

Also known as Una De Gato.

Cat’s claw grows in Central and South America, thriving in the Amazon rainforest. Use of the woody vine dates back to the Inca civilization.

Cat’s claw is used for the treatment of:
- Viral infections such as herpes and HIV
- Alzheimer’s disease
- Cancer
- Arthritis
- Immune system support
- Kidney health
- Prevent and abort pregnancy

Side effects are rare and include dizziness, headache, and vomiting.

Due to stimulation of immune system, it is unclear whether cat’s claw is safe in conditions affecting the immune system. Pregnant women and those trying to become pregnant should avoid cat’s claw.

Scientific evidence:
- Possible benefit in osteoarthritis and rheumatoid arthritis
- Stimulates the immune system in laboratory studies, but not proven to reduce inflammation or boost immune system in humans
Researchers are currently examining how cat’s claw may affect the brain.


**Chamomile (Matricaria Recutita, Chamomilla Recutita)**

There are two types of chamomile, German chamomile and Roman chamomile. German chamomile is more commonly used in the United States.

Chamomile has anti-allergy, anti-inflammatory, antibacterial, antifungal, and peptic ulcer protecting effects. **Plus,** it decreases histamine release.

Chamomile uses consist of:
- Sleeplessness
- Anxiety
- Gastrointestinal conditions
- Skin conditions
- Mouth ulcers

Allergic reactions to chamomile are rare and are more likely to occur if allergies to plants in the daisy family such as ragweed, chrysanthemums, marigolds, and daisies exist.

Evidence supports possible benefits for:
- Mouth ulcers
- Certain skin conditions
- Upset stomach
- Diarrhea in children

Studies are currently examining the use of chamomile for generalized anxiety disorder and for chronic pain caused by children’s bowel disorders.

Chasteberry (Vitex Agnus-Castus)

Also known as chaste-tree berry, vitex, and monk’s pepper

Chasteberry, the fruit of the chaste tree, is native to Central Asia and the Mediterranean region and has been used for thousands of years to alleviate menstrual conditions and to stimulate the production of breast milk.

The name is thought to come from a belief that the plant promoted chastity. It is reported that monks in the Middle Ages used chaste berry to decrease sexual desire.

Today, chasteberry is mostly used for:
- Menstrual conditions
- Premenstrual syndrome
- Menopause
- Infertility
- Acne

Side effects of chasteberry can be gastrointestinal problems, acne-like rashes, and dizziness. Research supports a benefit for premenstrual syndrome, breast pain, and some types of infertility. Researchers are currently exploring how chasteberry works in the body and how it might affect symptoms of premenstrual syndrome.

Cautions:
- May affect certain hormone levels and should be avoided by:
  - Pregnant women
  - Women on birth control pills or who have hormone-sensitive condition (such as breast cancer)
- May affect the dopamine system in the brain and should be avoided by people taking dopamine-related medications (selegiline, amantadine and levodopa)

Cranberry (*Vaccinium Macrocarpon*)

Also known as bog cranberry.

Cranberry is a native plant to North America and contains antioxidant and anticancer capabilities.

Uses historically include:
- Wounds
- Urinary disorders
- Diarrhea
- Diabetes
- Stomach ailments
- Liver conditions

Uses today include:
- Preventing or treating urinary infections
- Helicobacter pylori infections that can lead to stomach ulcers
- Prevent dental plaque

Drinking the juice excessively could cause gastrointestinal upset or diarrhea.

Scientific evidence supports that cranberry may prevent bacteria, such as E. coli, from clinging to the cells along the walls of the urinary tract and causing infection.


Dandelion (*Taraxacum Officinale*)

Also known as lion’s tooth and blowball.

Dandelion greens are edible and rich in vitamin A, vitamin K, and calcium. Native American and traditional Arabic medical systems utilize dandelion for the treatment of liver disease, kidney disease, and spleen conditions.

Today, dandelion is used as a:
- Liver “tonic”
- Kidney “tonic”
- Diuretic
- Digestive aid
There have been rare reports of upset stomach, diarrhea and allergic reaction. Dandelion is a potent diuretic and blood pressure and sodium levels should be monitored during its use. People with inflamed or infected gallbladder, or blocked bile ducts, should avoid using dandelion.

There is no compelling scientific evidence for using dandelion as a treatment for any medical condition.


**Echinacea (Echinacea Purpurea, Echinacea Angustifolia, and Echinacea Pallida)**

Also known as purple coneflower.

There are nine known species of Echinacea native to the United States and Southern Canada. Echinacea stimulates the immune system by improving the functioning of white blood cells to help fight infections.

Known uses include:
- Treat or prevent colds, flu, and other infections
- Treatment of wounds and other skin conditions such as acne or boils

Allergic reactions such as rash, gastrointestinal upset, increased asthma and anaphylaxis have been reported. Individuals who are allergic to plants in the daisy family or have asthma or atopy (genetic tendency toward allergic reactions) are more prone to allergic reactions.
Scientific results are mixed revealing no benefit for treating colds to possible benefit in treating upper respiratory infections. Studies continue to examine the benefits of echinacea for the treatment of upper respiratory infection and potential side effects on the immune system.


**Ephedra (Ephedra Sinica)**

Also known as ma huang.

Ephedra is an evergreen shrub-like plant native to Central Asia and Mongolia that has been used for more than 5,000 years. Ephedra’s principle active ingredient, ephedrine, stimulates the nervous system and heart.

Uses for ephedra include:

- Colds
- Fever
- Flu
- Headaches
- Asthma
- Wheezing
- Nasal congestion
- Weight loss
- Fatigue
- To enhance athletic performance

Scientific evidence:

- Poison control center surveys show a higher rate of side effects when compared with other herbal products
- Evidence of effectiveness in short-term weight loss.
- Increased risk of heart problems and stroke outweighs any benefits.
Current studies:

- Pharmacology of combined ephedrine/caffeine supplements
- Effects of ephedra on human adrenoceptor subtypes


Side effects:

- Nausea
- Anxiety
- Headache
- Psychosis
- Kidney stones
- Tremors
- Dry mouth
- Irregular heart rhythms
- Heart damage
- High blood pressure
- Restlessness
- Sleep problems
- Irritation of the stomach and increased urination

Cautions:

- In 2004, the FDA banned the sale of dietary supplements containing ephedra due to the unreasonable risk of injury or illness; particularly cardiovascular complication and risk of death. The ban does not apply to traditional Chinese herbal remedies or to products like herbal teas.
- Between 1995 and 1997, the FDA received more than 900 reports of possible toxicity. Serious adverse events such as stroke, heart attack and sudden death were reported in 37 cases.
- Ephedra may worsen many health conditions such as cardiovascular disease, kidney disease, sleep disorders, and diabetes.
- Avoid if pregnant, breastfeeding, and in children.
- May lead to serious health problems when used with other dietary supplements or medicines.
- Combining with caffeine increases the risk of serious side effects.
Test Yourself

Dandelion greens are edible and rich in:
A. Vitamin D, chromium, and vitamin A.
B. Vitamin B₁₂, folic acid, and chromium.
C. Vitamin A, vitamin K, and calcium.
The correct answer is C: vitamin A, K, and calcium.

European Elder (*Sambucus Nigra*)

Also known as black elder, elder, elderberry, elder flower, and sambucus.

European elder is native to Europe and parts of Asia and Africa and grows in the U.S. The dried flowers (elder flower) and the cooked blue/black berries (elderberry) are used in teas, liquid extracts and capsules.

Historical uses:
- Pain
- Swelling
- Infections
- Coughs
- Skin conditions

Today’s uses:
- Flu
- Colds
- Coughs
- Fevers
- Constipation
- Sinus infections

Uncooked or unripe elderberries are toxic and can cause nausea, vomiting, or severe diarrhea. Only the blue/black berries are edible. Because of elder flower’s possible diuretic effects, use caution in combination with diuretics.

Scientific evidence:
- Small studies indicate European elder may relieve flu symptoms. However, the evidence is not strong enough.
- Helps treat sinus infections when used with antibiotics (further research needed).
Evening Primrose Oil (*Oenothera Biennis*)

Also known as EPO.

This evening blooming plant is native to North America and grows in Europe and parts of the Southern Hemisphere.

Evening primrose oil (EPO) contains gammalinolenic acid (GLA), an essential fatty acid and has historically been used for the treatment of eczema. EPO is well tolerated with only mild side effects, gastrointestinal upset and headaches.

Today’s uses include:
- Eczema
- Inflammation
- Rheumatoid arthritis
- Breast pain associated with menstrual cycle
- Menopausal symptoms
- Premenstrual syndrome

Scientific evidence:
- Modest benefits for eczema
- May be useful for rheumatoid arthritis and breast pain
- Does not appear to affect menopausal symptoms
- Mixed results for effectiveness with premenstrual syndrome
Fenugreek (*Trigonella Foenum-Graecum*)

Fenugreek is commonly used in cooking. The dried seeds are ground and taken by mouth or used to form a paste that is applied to the skin. Studies show Fenugreek may help lower blood sugar levels.

Historical uses include:
- Menopausal symptoms
- Digestive problems
- Labor Induction

Today’s uses include:
- Diabetes
- Loss of appetite
- To stimulate milk production in breastfeeding
- Skin inflammation

Fenugreek side effects include gas, bloating, diarrhea, and irritation (topical). Women should use caution when taking fenugreek during pregnancy given its historical use for inducing childbirth.
Test Yourself
Which herb contains the principle active ingredient, ephedrine, which was banned by the FDA in 2004 because it raises blood pressure and is linked to heart attacks and strokes?

A. Ephedra  
B. Echinacea  
C. European elder

The correct answer is A: ephedra.

Feverfew (*Tanacetum Parthenium, Chrysanthemum Parthenium*)

Also known as bachelor’s buttons.

Feverfew is native to the Balkan mountain of Eastern Europe and now grows throughout Europe, North America and South America.

Historical uses include:
- Fever
- Headache
- Stomach ache
- Toothache
- Insect bites
- Infertility
- Problems with menstruation
- Problems with labor during childbirth
Today’s uses include:
- Migraine headache
- Rheumatoid arthritis
- Psoriasis
- Allergies
- Asthma
- Dizziness
- Nausea and vomiting

Scientific evidence:
- May be helpful in preventing migraine headaches
- Does not reduce rheumatoid arthritis symptoms in women whose symptoms did not respond to conventional medicines but may help those with milder symptoms
  researchers are studying ways to standardize feverfew and prepare it in a consistent manner for possible use in future studies for migraines.


Feverfew (*Tanacetum Parthenium, Chrysanthemum Parthenium*)

Side effects:
- Canker sores
- Swelling and irritation of the lips and tongue; loss of taste
- Nausea
- Digestive problems
- Bloating
Prolonged use and discontinuation effects include:

- Headaches
- Nervousness
- Difficulty sleeping
- Stiff muscles
- Joint pain

Cautions:

- Avoid in pregnancy due to uterus contraction and increased risk of miscarriage or premature delivery.
- Avoid if allergic to other members of the daisy family.

**Flaxseed (Linum Usitatissimum)**

Also known as linseed.

Flaxseed originated in Egypt and now grows in Canada and the northwestern United States. Flaxseed contains lignans (phytoestrogens or plant estrogens) and soluble fiber. However, flaxseed oil lacks lignans. Lignans also act as antioxidants.

Flaxseed is used for constipation, hot flashes, breast pain, high cholesterol, and for cancer prevention.

Flaxseed oil is used for arthritis, high cholesterol, and cancer prevention.

Flaxseed, like any other supplemental fiber source, should be taken with plenty of water to prevent constipation and in rare cases, intestinal blockage. Flaxseed’s fiber content may lower the body’s ability to absorb medications taken by mouth. Flaxseed should not be taken at the same time as any conventional oral medications or other dietary supplements.

Scientific evidence:

- Effective laxative
- Mixed results for lowering cholesterol levels and decreasing hot flashes
- The alpha-linolenic acid in flaxseed and flaxseed oil may benefit people with heart disease

Researchers are studying the effects of flaxseed on high cholesterol levels and the possible role in preventing heart disease and osteoporosis.
Garlic (*Allium Sativum*)

Garlic is an edible plant bulb from the lily family. It has been used as a medicine or spice for thousands of years.

**Uses:**
- High cholesterol
- Heart disease
- High blood pressure
- To prevent stomach and colon cancer

**Side effects** are more common with raw garlic and include breath and body odor, heartburn, upset stomach, and allergic reactions.

**Cautions:**
Garlic can thin the blood and should be avoided one week prior to surgery or dental work. It should be used with caution in bleeding disorders. Garlic also interferes with the effectiveness of saquinavir used to treat HIV infection.

**Scientific evidence:**
- Can slightly lower blood cholesterol levels
- May slow the development of atherosclerosis
- Mixed result on effectiveness of slightly lowering blood pressure
- May lower the risk of certain cancers
- No effect in preventing stomach cancer in long term use

Researchers are studying how garlic interacts with certain drugs and how it thins the blood.
**Ginger (Zingiber Officinale)**

Ginger is a tropical plant with green-purple flowers and an aromatic underground stem called a rhizome.

**Uses:**
- Stomach aches
- Cold and flu
- Nausea
- Post-surgery
- Motion sickness
- Chemotherapy
- Pregnancy
- Diarrhea
- Rheumatoid arthritis
- Osteoarthritis
- Joint and muscle pain

Ginger has few side effects when taken in small doses:
- Gas
- Bloating
- Heartburn
- Nausea

**Scientific evidence:**
- Relief of pregnancy-related nausea and vomiting.
- Mixed results on effectiveness for nausea caused by motion, chemotherapy, or surgery.
Investigators are studying:

- Whether ginger interacts with drugs, such as those used to suppress immune system.
- Ginger’s effect on reducing nausea in chemotherapy.
- The safety and effectiveness of use for health purposes.
- The active components and effects on inflammation.


\textbf{Ginkgo (Ginkgo Biloba)}

Also known as fossil tree, maidenhair tree, Japanese silver apricot, baiguo, bai guo ye, kew tree, and yinhsing.

Ginkgo is one of the oldest types of trees in the world. Ginkgo seeds have been used in traditional Chinese medicine for thousands of years.

Historical uses include:
- Asthma
- Bronchitis
- Fatigue
- Tinnitus

Today’s uses include:
- Memory loss
- Dementia and Alzheimer’s disease
- Intermittent claudication (leg pain caused by narrowing arteries)
- Sexual dysfunction

Scientific evidence:
- Promising results for intermittent claudication
• Ineffective in lowering the overall incidence of dementia and Alzheimer’s disease in the elderly
• Mixed results for memory enhancement

Recent areas of research for effectiveness:
• Asthma
• Multiple sclerosis
• Intermittent claudication
• Cognitive decline
• Sexual dysfunction due to antidepressants
• Insulin resistance

Studies are also examining ginkgo's interactions with prescription drugs.


Side effects:
• Headache
• Nausea
• Gastrointestinal upset
• Diarrhea
• Dizziness
• Allergic skin reactions

Cautions:
• Can increase bleeding risk and should be used with caution in combination with anticoagulant drugs, in presence of bleeding disorder or prior to scheduled surgery/dental procedures
• Uncooked ginkgo seeds contain ginkgotoxin which can cause seizures; consuming large quantity of seeds over time can cause death

**Asian Ginseng (Panax Ginseng)**

Also know as ginseng, Chinese ginseng, Korean ginseng, and Asiatic ginseng.

Asian Ginseng has been used in various systems of medicine for centuries. The root contains active chemical components called ginsenosides or panaxosides that are responsible for its medicinal purposes.

**Uses:**
- Support overall health
- Boost immune system
- Increase sense of well-being
- Increase stamina
- Improve mental and physical performance
- Erectile dysfunction
- Hepatitis C
- Symptoms related to menopause
- High blood sugar
- High blood pressure

**Scientific evidence:**
- May lower blood glucose
- Possible beneficial effects on immune function

**Current research:**
- Interactions with other herbs and drugs
- Treatment of chronic lung infection
- Effectiveness in impaired glucose tolerance
- Treatment of Alzheimer’s disease
Asian Ginseng (*Panax Ginseng*)

Side effects from products include (could have been due to another herb or drug in the product):
- Allergic reactions
- Breast tenderness
- Menstrual irregularities
- High blood pressure
- Headache
- Sleep problems
- Gastrointestinal problems

Cautions:
- In diabetes, may lower blood sugar especially if using medications to lower blood sugar or taking other herbs such as bitter melon and fenugreek which also lower blood sugar.

**Test Yourself**

Flaxseed contains lignans; flaxseed oil **lacks** lignans. What are lignans?
- A. Phytoestrogens or plant estrogens
- B. Form of fiber
- C. Ginsenosides

The correct answer is A: phytoesterogens or plant estrogens.
Goldenseal (Hydrastis Canadensis)

Also known as yellow root.

Goldenseal grows wild in United States and has become endangered by overharvesting. The United States grows it commercially, especially in the Blue Ridge Mountains. Manufacturers often combine goldenseal with echinacea in cold preparations. It was historically used for skin diseases, ulcers, and gonorrhea.

Today’s uses consist of:
- Colds
- Respiratory tract infections
- Infectious diarrhea
- Eye infections
- Vaginitis
- Cancer
- Wounds
- Canker sores
- Sore gums, mouth, and throat

Berberine, a compound in goldenseal, may be beneficial for infections causing diarrhea and in eye infections. Goldenseal is currently being studied for its action against tumors.

Cautions:
- May cause changes in the way the body processes drugs and could potentially increase the level of some drugs (drug interactions have not been reported and there was no interaction with indinavir in a study).
- Do not use if pregnant or breastfeeding. Berberine may cause the uterus to contract, increasing the risk of premature labor or miscarriage. Berberine can also cause life-threatening liver problems in nursing infants.
- Do not give to infants or young children.
Grape Seed Extract (*Vitis Vinifera*)

The leaves and fruit of the grape have been used medicinally since ancient Greece. Grape seed extract contains antioxidant substances that prevent cell damage caused by free radicals. Generally, wine manufacturers provide the grape seed extract to be used in capsule and tablet form.

Free radicals are compounds formed when our bodies convert the food we eat into energy. People are also exposed to free radicals in the environment from cigarette smoke, air pollution, and ultraviolet light from the sun.

Uses:
- Atherosclerosis
- High blood pressure
- High cholesterol
- Poor circulation
- Diabetes complications
- Swelling after injury of surgery
- Wound healing
- Cancer prevention

Side effects reported:
- Headache
- Dry, itchy scalp
- Dizziness
- Nausea

Scientific evidence:
- Beneficial antioxidant effects
- Does not reduce the hardening of breast tissue that can occur after radiation therapy for breast cancer

Scientists are currently studying grape seed extract’s effectiveness in preventing breast and prostate cancers, as well as the benefit to the heart and the protective effects in the brain.
Green Tea (*Camellia Sinensis*)
Also known as Chinese tea and Japanese tea.
Green tea is produced by steaming the fresh leaves of the camellia sinensis plant.
Uses:
- Prevent and treat breast, stomach, and skin cancer
- Improve mental alertness
- Aid in weight loss
- Lower cholesterol levels
- Protect skin from sun damage

Side effects:
- Safe in moderate amounts (adults)
- Liver problems (rare) with concentrated green tea extracts (not teas)

Contains caffeine, therefore side effects of caffeine can include:
- Insomnia
- Anxiety
- Irritability
- Upset stomach
- Nausea
- Diarrhea
- Frequent urination

Cautions:
Concentrated green tea extracts should be taken with food. Should not be used with liver disease or symptoms of liver disorder such as abdominal pain, dark urine, or jaundice.
Additionally, green tea contains small amounts of vitamin K which can make anticoagulant drugs less effective.

Scientific evidence:
- May help protect against or slow the growth of certain cancers
- Improves mental alertness most likely because of its caffeine content

Current studies in progress:
- Components of green tea and the effects on cancer, diabetes and heart disease.

**Hawthorn (Crataegus Laevigata, Crataegus Oxyacantha, Crataegus Monogyna)**
Also known as English hawthorn, harthorne, haw, and hawthorne.
This spiny, flowering shrub of the rose family is native to northern European regions and grows throughout the world. Hawthorne contains a positive inotrope that improves cardiac contractility. Historically used for heart disease, digestive problems and kidney problems and used today for heart failure and coronary artery disease.

Hawthorn is safe for adults when used for short periods of time. Side effects can include upset stomach, headache and dizziness. Hawthorn was once thought to interact with digoxin, but small studies in people without heart conditions, found no interaction.

Scientific evidence shows hawthorn effective in the treatment of milder forms of heart failure. Researchers are currently studying the mechanism of effect on heart failure.
Hoodia (*Hoodia Gordonii*)

Also known as Kalahari cactus and Xhoba.

The hoodia plant is native to the Kalahari Desert in southern Africa and issued for its appetite suppressant qualities. Kalahari bushmen eat hoodia stems to reduce their hunger and thirst during long hunts. Hoodia products often contain other herbs or minerals such as green tea or chromium picolinate.

There is no reliable evidence to support the use of hoodia for weight loss and its side effects and interactions with medicines and other supplements have not been studied.

The harvesting of hoodia is protected by conservation laws and some reports suggest that some products sold as hoodia do not contain any hoodia.
Horse Chestnut (*Aesculus Hippocastanum*)

Also known as buckeye and Spanish chestnut.

Horse chestnut is a native plant to the Balkan Peninsula and grows throughout the Northern Hemisphere. The seed extract contains the active ingredient, aescin, which constricts blood vessels, reduces swelling and increases venous tone. Scientific evidence confirms that horse chestnut is beneficial in treating chronic venous insufficiency and is as effective as wearing compression stockings.

Uses:
- Hemorrhoids
- Chronic venous insufficiency
  - Varicose veins
  - Pain
  - Ankle swelling
  - Feelings of heaviness
  - Itching
  - Nighttime leg cramping

Cautions and side effects:
When horse chestnut is properly processed and contains little or no esculin (poisonous substance), it is considered safe. The extract can cause some side effects such as itching, nausea and gastrointestinal upset. Homemade preparations should not be used.

**Kava (Piper Methysticum)**

Also known as kava, awa, and kaya pepper.

The kava plant, a member of the pepper family, has been used as a ceremonial beverage for centuries in the South Pacific.

Historical uses include:
- Sleeplessness
- Fatigue
- Asthma
- Urinary tract infections
- Numbing agent (topical)

Today’s uses include:
- Anxiety
- Insomnia
- Menopausal symptoms

Reported side effects have been liver damage (rare), dystonia and scaly, yellowed skin. Individuals should avoid driving and operating heavy machinery due to the drowsiness effect. Kava may interact with several drugs, including drugs used for Parkinson’s disease.

Scientific evidence supports that kava may be beneficial for the management of anxiety. However, the FDA has issued a warning that Kava supplements have been linked to a risk of severe liver damage and further studies have been suspended.


**Lavender (Lavandula Angustifolia)**

Also known as English lavender and garden lavender.

Ancient Egypt used lavender as part of the process for mummifying bodies. Native to the Mediterranean region and used as a bath additive in Persia, Greece and Rome. Lavender is most commonly used in aromatherapy. It has historically been used to improve mental health and as an antiseptic.

Uses today include:
- Anxiety
• Restlessness
• Insomnia
• Depression
• Headache
• Upset stomach
• Hair loss

Side effects include:
• Irritation (topical)
• Headache
• Changes in appetite (oral)
• Constipation

While small studies show mixed results for lavender’s effectiveness, preliminary studies indicate that lavender oil, combined with oils from other herbs, may help with hair loss. Use of lavender with sedative medications may increase drowsiness. Lavender oil is also poisonous if taken by mouth.


Licorice Root (*Glycyrrhiza Glabra, Glycyrrhiza Uralensis*)

Also known as licorice, sweet root, and gan zao.

Licorice root is grown in Greece, Turkey, and Asia. Peeled licorice root is available in dried and powdered forms, capsules, tablets and liquid extracts. Licorice root can be found with glycyrrhizin removed and is called DGL (deglycyrrhizinated licorice).

Licorice root is most commonly used for:
• Stomach ulcers
• Bronchitis
• Sore throat
• Infections caused by viruses, such as hepatitis

Scientific evidence reveals that glycyrrhizin, the active ingredient in licorice root, might reduce complications from hepatitis C.
Side effects (licorice root containing glycyrrhizin):
- High blood pressure
- Salt and water retention
- Low potassium levels which can lead to heart problems

Cautions:
- Do not take with diuretics or other medicines that reduce potassium level.
- Caution in use with heart disease or high blood pressure.
- Do not take as supplement or food if pregnant, can increase the risk of pre-term labor.
- In large amounts, can affect body’s level of cortisol and related steroid drugs.


Milk Thistle (Silybum Marianum)

Also known as Mary thistle and holy thistle.

Milk thistle is a native plant of the Mediterranean region. Silymarin which is extracted from the seeds is the active part of the herb. Milk thistle exhibits protective effects on the liver and improves its function. In the United States, milk thistle is the most popular herbal product for liver disease.

Uses:
- High cholesterol
- Type 2 diabetes with cirrhosis (reduces insulin resistance)
- Breast, cervical, and prostate cancers (reduces growth of cancer cells)

Side effects:
- Laxative effect
- Upset stomach
- Diarrhea
- Bloating
- Allergic reactions in people who are allergic to plants in same family such as ragweed, chrysanthemum, marigold, and daisy

Scientific evidence:
- May benefit the liver by protecting and promoting the growth of liver cells, fighting oxidation (a chemical process that can damage cells) and inhibiting inflammation
- Promising data on the effectiveness in liver disease, but results are mixed
Scientist are currently researching the effectiveness of milk thistle in the treatment of:

- Chronic hepatitis C
- Nonalcoholic steatohepatitis (liver disease that occurs in people who drink little to no alcohol)
- Cancer prevention and HIV complications


**Mistletoe (Viscum Album)**

Also known as European mistletoe; not to be confused with American mistletoe which is used as a decoration.

Mistletoe has historically been used for headaches and seizures and is used today, in Europe, for the treatment of cancer. In Europe, the mistletoe extracts are prescription drugs given by injection. In the United States, the injection of mistletoe is available only in clinical trials.

Side effects of raw, unprocessed European mistletoe or American Mistletoe:

- Vomiting
- Seizures
- Slowing of heart rate
- Death

Side effect of injected mistletoe:

- Itching or redness in area of injection
- More extensive skin reactions
- Low-grade fevers
- Flu-like symptoms
- Allergic reactions such as difficulty breathing

Scientific evidence shows that mistletoe kills cancer cells and stimulates the immune system. Thirty European trials have showed improvements in survival or quality of life. However, the trials had major design weaknesses. Scientists are currently researching mistletoe’s toxicity, safety, and immune system effects when combined with gemcitabine (chemotherapy drug).

Noni (Morinda Citifolia)

Also known as morinda, Indian mulberry, hog apple, and canarywood.

Noni grows throughout the tropical regions of the Pacific Ocean and is traditionally used in Polynesia as a dye. Noni is high in potassium and is often combined with other fruits to make juice.

Noni has historically been used as a topical preparation for the treatment of joint pain and skin conditions. Today it is used as a general health tonic and for the treatment of cancer, cardiovascular disease and diabetes.

Research shows that Noni has antioxidant, immune-stimulating and tumor-fighting properties. Researchers are studying Noni for its safety and potential effects on tumors and symptoms, as well as for the prevention and treatment of breast cancer.

Side effects of liver damage have been reported. Noni should not be used by individuals with liver disease or who are on a potassium-restricted diet.


Peppermint Oil (Mentha x Piperita)

Peppermint oil is a cross between two types of mint; water mint and spearmint. It grows throughout Europe and North America and is used to flavor foods. The leaves can be used fresh or dried in teas.

Peppermint oil is used for:
  • Nausea
• Indigestion
• Cold symptoms
• Headaches
• Muscle and nerve pain
• Stomach and bowel conditions

Scientific evidence supports that peppermint oil may improve symptoms of irritable bowel syndrome, and when combined with caraway oil, may help relieve indigestion.

In small doses, side effects have been allergic reactions and heartburn. Peppermint oil should not be taken with antacids. The capsules are often coated to reduce likelihood of heartburn. If taken with antacids, this coating can breakdown, increasing the likelihood of heartburn.


Red Clover (Trifolium Pratense)

Also known as cow clover, meadow clover, and wild clover.

Red clover belongs to the legume family of plants. It contains phytoestrogens, compounds similar to the female hormone, estrogen.

Red clover has been used for:

Historically:
• Cancer
• Respiratory problems such as whooping cough, asthma, and bronchitis

Today’s uses include:
• Menopausal symptoms
• Breast pain associated with menstrual cycles
• High cholesterol
• Osteoporosis
• Prostate enlargement
Red clover is safe for adults when used for short periods of time. Side effects reported have been breast enlargement and tenderness. Because of the estrogen-like compounds, there is a possibility that its long-term use would increase the risk of women developing cancer of the lining of the uterus. It is unclear if it is safe for pregnant or breastfeeding women, or women who have breast cancer or other hormone-sensitive cancers.

The scientific evidence in the effectiveness for menopausal symptoms shows mixed results in small studies, with no beneficial effects in one large study. Researchers are currently investigating red clover’s active components and its effectiveness for menopausal symptoms.

(Saw Palmetto (Serenoa Repens, Sabal Serrulata)

Also known as American dwarf palm tree and cabbage palm.

Saw palmetto is a small palm tree native to the southeastern United States. The fruit was used medicinally by the Seminole Tribe of Florida.

Individuals use saw palmetto today for:
- Urinary symptoms associated benign prostatic hyperplasia
- Chronic pelvic pain
- Bladder disorders
- Decreased sex drive
- Hair loss
- Hormone imbalances

Reported side effects include:
- Stomach discomfort
- Tender breast (men)
- Decline in sexual desire (men)

Scientific evidence for treatment of benign prostatic hyperplasia:
• May be effective (small studies)
• No improvement (one large study)
• Does not appear to affect readings of prostate-specific antigen (PSA) levels which are screened for prostate cancer


**Soy (Glycine Max)**

Soy is a plant in the pea family that has been common in Asian diets for thousands of years. Soybeans, the high protein seeds, contain isoflavones (compounds similar to female hormone estrogen). Soy is often used as an additive in processed foods including baked goods, cheese, and pasta. Soy is safe when used for short periods as a supplement.

Soy is used for:
- High cholesterol
- Menopausal symptoms such as hot flashes
- Osteoporosis
- Memory problems
- High blood pressure
- Breast cancer
- Prostate cancer

Side effects include:
- Nausea
- Bloating
- Constipation
- Rare allergic reactions such as breathing problems and rash

Women who have or who are at increased risk of developing breast cancer or other hormone-sensitive conditions such as ovarian or uterine cancer should be careful about using soy.

Scientific evidence:
- Daily intake of soy protein may slightly lower levels of LDL (“bad”) cholesterol.
- Soy isoflavones supplements may reduce hot flashes in women after menopause.
- Evidence is mixed on whether using isoflavone supplements can increase the risk of endometrial hyperplasia, a thickening of the lining of the uterus that can lead to cancer.
Researchers are currently studying soy’s effects on women’s arteries and bones after menopause.


**St. John’s Wort (Hypericum Perforatum)**

Also known as hypericum, Klamath weed, and goat weed.

St. John’s wort is a yellow flowered plant that was first recorded in ancient Greece for its medicinal purposes. The name refers to John the Baptist, as the plant blooms around the time of the feast of St. John the Baptist in late June.

St. John’s wort has been used historically for:
- Mental disorders
- Nerve pain
- Sedative
- Malaria
- Balm for wounds, burns, and insect bites

Today’s uses include:
- Depression
- Anxiety
- Sleep disorders

Evidence shows that St. John’s wort is useful in treating mild to moderate depression. Researchers are currently examining its use in mood disorders including minor depression.

Side effects:
- Increased sensitivity to sunlight
- Phototoxic skin reactions in high doses
- Anxiety
- Dry mouth
- Dizziness
- Gastrointestinal symptoms
- Fatigue
- Headache
- Sexual dysfunction
Cautions:

- When combined with other depressants, may increase side effects such as:
  - Nausea
  - Anxiety
  - Headache
  - Confusion
- May speed or slow a drug’s breakdown. Drugs that can be affected include:
  - Antidepressants
  - Birth control pills
  - Cyclosporine
  - Digoxin
  - Indinavir and possibly other drugs used to control HIV infection
  - Irinotecan and possibly other drugs used to treat cancer
  - Warfarin and related anticoagulants

**Thunder God Vine (Tripterygium Wilfordii)**

Also known as lei gong teng.

Thunder god vine is a perennial vine native to China, Japan, and Korea. China has used it for health purposes for 400 years for inflammation or over activity of the immune system.

Thunder god vine is used today for:

- Excessive menstrual periods
- Autoimmune diseases including rheumatoid arthritis, multiple sclerosis, and lupus
- Rheumatoid arthritis (topical)

Scientific evidence:

- May fight inflammation, suppress the immune system and have anti-cancer effects.
- Suggests improvement in rheumatoid arthritis symptoms in some patients.

Studies are currently comparing thunder god vine with a conventional medicine for rheumatoid arthritis.

Side effects:

- Diarrhea
- Upset stomach
- Hair loss
- Headache
- Menstrual changes
- Skin rash

Cautions:
- Poisonous if not carefully extracted from the skin root.
- The leaves, flowers, and skin of the root are highly poisonous and can cause death.
- Decrease in bone mineral density in women who take the herb for five years or longer.
- Decreased sperm count and may be associated with male infertility.

[https://nccih.nih.gov/health/tgvine](https://nccih.nih.gov/health/tgvine))

**Turmeric (Curcuma Longa)**

Also known as turmeric root and Indian saffron.

Turmeric is related to ginger. It is grown throughout India, Asia, and Africa and is used in fabric dyes and foods. Turmeric has historically been used to aid digestion and liver function, relieve arthritis pain, regulate menstruation, and treat eczema and wounds.

Individuals use it today for:
- Heartburn
- Stomach ulcers
- Gallstones
- Inflammation
- Prevent and treat cancer

High doses or long term use of turmeric may cause indigestion. Dietary supplements containing turmeric should be avoided in gallbladder disease as it may worsen the condition.

Evidence suggests that curcumin, a chemical found in turmeric, may have anti-inflammatory and anticancer properties.

Researchers are currently studying turmeric’s active chemicals and side effects.
Valerian (*Valeriana Officinalis*)

Also known as all-heal and garden heliotrope.

Valerian is native to Europe, Asia, and North America and used as medicinal herb since ancient Greece and Rome. Hippocrates described the therapeutic uses, and in the 2nd century, Galen prescribed valerian for insomnia.

Uses today include:
- Sleep disorders
- Anxiety
- Headaches
- Depression
- Irregular heartbeat
- Trembling

Valerian is safe for short periods of time (4-6 weeks). The following side effects have been reported:
- Headaches
- Dizziness
- Upset stomach
- Tiredness the morning after its use

Evidence supports that valerian may be helpful for insomnia.

Researchers are investigating valerian’s effects on sleep in healthy older adults and in people with Parkinson’s disease.
Yohimbe (Pausinystalia Yohimbe)

Also known as yohime bark.

Yohimbe is a native plant of western Africa. The bark contains the chemical, yohimbine. A standardized form of yohimbine, yohimbine hydrochloride, is available as a prescription medicine for the treatment of erectile dysfunction.

Yohimbe has historically been used to increase sexual desire and is used today to treat sexual dysfunction.

The following yohimbe side effects have been reported:

- High blood pressure
- Increased heart rate
- Headache
- Anxiety
- Dizziness
- Sleeplessness

Yohimbe is dangerous if taken in large doses and should not be combined with tricyclic antidepressants or phenothiazines. Caution should be used if taking with MAO inhibitors or medicines for high blood pressure. It is advised to avoid Yohimbe with kidney problems and psychiatric conditions.

There have been no clinical trials conducted on the effectiveness of yohimbe. Although numerous studies of the prescription medicine yohimbine hydrochloride have been conducted, their results cannot be interpreted as evidence for the dietary supplement yohimbe.

Reflection

In what ways can you better assess the herbs and medications your patients are taking?
What educational information do you provide on the interactions between herbs and medications?

**Test Yourself**

When combined with other depressants, St. John’s wort can cause:

A. Depression  
B. Constipation  
C. Anxiety

The correct answer is C: anxiety.

**Aromatherapy**

Aromatherapy is the art and science of utilizing naturally extracted aromatic essences from plants to balance, harmonize, and promote the health of body, mind, and spirit.

As a holistic practice, Aromatherapy is both a preventative approach as well as an active method to employ during acute and chronic stages of illness or disease.

Aromatherapy is designed to affect the whole person not just the symptom or disease and to assist the body's natural ability to balance, regulate, heal, and maintain itself.

Studies indicate positive findings for the use of aromatherapy as an adjunct to, but not a replacement of, allopathic care for both anxiety and depression with the high risk postpartum woman.

**Note!** Essential oils are complex and typically contain about 160 constituents.

**Aromatherapy: The History**

- Detailed recipes using aromatic compounds are given in the Old Testament and well sealed urns filled with aromatic resins have been unearthed in the tombs of Pharaohs.
- Extensive therapeutic use of essential oils is recorded in ancient China and India and much of the Middle East.
- Widespread use of distilled essential oils from Europe began after the invention of glass distillation mechanisms in the 16th century and this opened the door to extracting the volatile components from chamomile, lavender and rosemary, and other plants.
- The popular use of essential oils and herbs for therapeutic purposes became eclipsed by the development of the microscope and the ability to isolate certain bioactive compounds and reproduce them synthetically. The most common example is the herb
White Willow Bark; replaced by the synthetic form of this plant’s pain relieving compound, salicylic acid, which we know as aspirin.

- Modern interest is credited to the famous story of French chemist Rene-Maurice Gattefosse and his miraculous cure after burning himself in his cosmetics lab in the early 1900’s. In fact, he coined that term ‘Aroma-therapie’ in 1937 and produced a Materia Medica of the therapeutic uses of the aromatic extracts.

The Absorption and Effects of Essential Oils

Glandular:
Essential oils probably exert their most powerful and direct pharmacological effects systemically via the blood supply to the brain. They also have an indirect effect via the olfactory nerve pathways into the brain. Essential oil fragrances are absorbed through blood circulation and nerve pathways from the sinuses into the central glands of the brain, which control emotional, neurological, and immunological functions.

Skin:
Essential oils are absorbed in minute quantities through the skin, depending on the oil, dilution, and application (carrier oil, compress, etc.). Many of the indications for specific oils include various skin conditions.

Respiratory:
Essential oils are inhaled during treatment and have a direct effect on the sinuses, throat, and lungs. Many essential oils are specific medicines for respiratory conditions.

Note! Inhalation is as easy as sniffing drops on a tissue

Circulation:
Many essential oils have beneficial effects on circulatory problems, both through dermal and respiratory absorption. These oils enhance the circulation stimulating effects of massage.

External Use:
The safest and most pleasant method of delivery is the external use of essential oils (highly diluted) on the skin, usually in the form of massage (self or professional). Local application of diluted oils (in a vegetable oil base) as well as full-body massage is quite effective, providing relaxation as well as a physiological action through the nervous system. Baths are equally as relaxing.

Dilution:
Essential oils are diluted before application to the skin to ensure safety, slow their evaporation rate, and increase the surface area to be covered.
Top Ten Essential Oils and Uses

1. **Peppermint**: headaches, muscle aches, and digestive disorders
2. **Eucalyptus**: respiratory problems, decreased immune system, and muscle tension
3. **Ylang Ylang**: anxiety, muscle tension and depression
4. **Geranium**: hormonal disturbances in women, skin imbalances, anxiety, depression
5. **Lavender** (*Lavandula angustifolia*): anxiety, wounds, burns (*Lavandula vera*): hormonal disturbances in women, skin imbalances, anxiety, depression
6. **Lemon**: depression, anxiety, wounds, infections, odors
7. **Clary Sage**: pain, anxiety, insomnia, hormonal imbalances, spasms
8. **Tea Tree**: decreased immune system, fungal infections including vaginal yeast infections, jock itch, athletes foot, and ringworm
9. **Roman Chamomile**: sleeplessness, anxiety, wounds, infection, muscle aches and tension
10. **Rosemary**: mental fatigue, depression, decreased immune system, digestive disorders, muscle aches and tension

Aromatherapy Side Effects and Cautions

Overexposure to essential oils, especially in confined areas, can cause dizziness, nausea, light headedness, headache, blood sugar imbalances, irritability, and euphoria.

Citrus oils, bergamot being the most reactive, can cause phototoxicity. Avoid direct exposure to UV rays after application to the skin. The best treatment for skin irritation from essential oils is to apply a fatty oil, such as coconut, which will dilute the impact of the essential oils. The use of only pure essential oils and not synthetic fragrances is recommended.

Air, heat, and light degrade essential oils. Store essential oils in a cool, dark room and keep the oil container tightly sealed. Do not use essential oils on infants, children, pregnant women, the elderly, or those with serious health problems, without advanced medical guidance.

Aromatherapy Interactions

The risks concerning drug-essential oil interactions are extremely low especially if the administration routes are external and the doses employed remain low. Internal or intensive administration methods (oral, rectal, vaginal) at elevated doses carry a much greater risk.

Persons with significant hepatic and renal impairment are more vulnerable to toxic effects of essential oils and drugs as there will be significant disturbance to pharmacokinetics. For those individuals, intensive and internal use of essential oils is not recommended. In persons with significant renal disease, compensatory mechanisms exist to maintain glomerular filtration by increasing renal blood flow. These mechanisms are dependent on the effects of prostaglandins. Eugenol, thymol, and carvacrol are potent prostaglandin inhibitors, thus essential oils containing these components should be avoided, even via dermal application.
Persons taking multiple medications for serious disease may also have impaired detoxification capabilities and the risk of interaction is elevated. Thus internal use of essential oils is not advised. Essential oils might augment or diminish chemotherapy drug actions or bioavailability. This concern may be allayed due to the relative concentrations of the drug versus the essential oil. The most likely scenario is that the drug would alter the pharmacokinetics of the essential oil.

**Test Yourself**

Match the essential oil with its use:

- A. Peppermint
- B. Tea tree
- C. Chamomile
- D. Eucalyptus

1. Digestive disorders
2. Sleeplessness
3. Athletes foot
4. Respiratory problems

The correct answers are as follows; A = 1, B = 3, C = 2, D = 4

**What is a Nutritional Supplement?**

As defined by Congress in the Dietary Supplement Health and Education Act, which became law in 1994, a dietary or nutritional supplement is a product (other than tobacco) that:

- Is intended to supplement the diet.
- Contains one or more dietary ingredients including vitamins, minerals, herbs, amino acids, and other substances.
- Is intended to be taken by mouth as a pill, capsule, tablet, or liquid.
- Is labeled on the front panel as being a dietary supplement.

**Dietary Guidelines**

The federal government’s 2015-2020 Dietary Guidelines for America state:

> “An underlying premise of the Dietary Guidelines is that nutritional needs should be met primarily from foods. All forms of foods, including fresh, canned, dried, and frozen, can be included in healthy eating patterns. Foods in nutrient-dense forms contain essential vitamins and minerals and also dietary fiber and other naturally occurring substances that may have positive health effects. In some cases, fortified foods and dietary”
supplements may be useful in providing one or more nutrients that otherwise may be consumed in less-than-recommended amounts.”  

(USDHHS, 2017)

Test Yourself
The Dietary Supplement Health and Education Act became law in what year?

A. 1894  
B. 1994  
C. 2004

The correct answer is B: 1994.

Calcium
Calcium is stored in the bones and teeth and supports their structure and hardness. The body also needs calcium to:

- Move muscles  
- To carry nerve messages between the brain and every body part  
- To help blood vessels move blood throughout the body  
- To help release hormones and enzymes that affect almost every function in the human body

Calcium-rich foods:

- Milk  
- Yogurt  
- Cheese  
- Kale  
- Broccoli  
- Chinese cabbage  
- Fish with soft bones that you eat such as canned sardines and salmon  
- Most grains while not rich in calcium, add significant amounts of calcium to the diet because people eat them often

Many people do not get the recommended amounts of calcium from the foods they eat, including:

- Boys aged 9-13 years  
- Girls aged 9-18 years  
- Women older than 50 years  
- Men older than 70 years

Insufficient intakes of calcium do not produce obvious symptoms in the short term because the body maintains calcium levels in the blood by taking it from bone. Over the long term, intakes of calcium below recommended levels can cause low bone mass (osteopenia) and increase the risks of osteoporosis and bone fractures. Symptoms of serious calcium deficiency include
numbness and tingling in the fingers, convulsions, and abnormal heart rhythms that can lead to death if not corrected.

**Calcium Supplements**

What kinds of calcium dietary supplements are available?

<table>
<thead>
<tr>
<th>Calcium Carbonate</th>
<th>Calcium Citrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inexpensive</td>
<td>More expensive</td>
</tr>
<tr>
<td>Absorbed best when taken with food</td>
<td>Absorbed well on an empty or a full stomach</td>
</tr>
<tr>
<td>Over-the-counter antacid products such as Tums® and Rolaids® contain calcium carbonate</td>
<td>Absorbed more easily in people with low levels of stomach acid (more common in people older than 50)</td>
</tr>
</tbody>
</table>

**Calcium Side Effects**

Calcium supplements side effects:

- Constipation*
- Gas*
- Bloating*
- Interference with the body's ability to absorb iron and zinc increase the risk of kidney stones

*Spread the calcium dose throughout the day, taking the supplement with meals, or changing the supplement brand or calcium form you take.

**Medications that Lower Calcium Levels**

Calcium supplements reduce absorption of the following medications:

- Bisphosphonates (to treat osteoporosis)
- Antibiotics (fluoroquinolone and tetracycline families)
- Levothyroxine (to treat low thyroid activity)
- Phenytoin (an anticonvulsant)
- Tiludronate disodium (to treat Paget's disease)

Thiazide-type diuretics (such as Diuril® and Lozol®) increase calcium levels.

Medications that decrease calcium levels

- Mineral oil and stimulant laxatives
- Antacids containing aluminum or magnesium (by increasing calcium loss in the urine)
- Loop diuretics (such as Lasix® and Bumex®)
- Glucocorticoids (such as prednisone) leads to osteoporosis when used for months at a time
Chromium

Chromium enhances the action of insulin, a hormone critical to the metabolism and storage of carbohydrate, fat, and protein in the body. Actual chromium deficiency is rare and chromium status is difficult to determine because blood, urine, and hair levels do not necessarily reflect body stores. Furthermore, no chromium-specific enzyme or other biochemical marker has been found to reliably assess a person's chromium status.

The body's chromium content may be reduced under several conditions:
- Diets high in simple sugars (more than 35% of calories)
- Infection
- Acute exercise
- Pregnancy and lactation
- Stressful states (such as physical trauma)

Chromium foods:
- Whole grains
- Brown rice
- Meat
- Broccoli
- Mushrooms
- Green beans
- Brewer’s yeast
- Red wine
- Basil
- Fish
- Potatoes
- Dairy products

Scientific evidence:
The most active areas of chromium research are its use to treat diabetes, lower blood lipid levels, promote weight loss, and improve body composition. Overall, the value of chromium supplements for diabetics is inconclusive and controversial. The effects of chromium supplementation on blood lipid levels in humans are also inconclusive.

Chromium Interactions

The following medications may have their effects enhanced if taken together with chromium or they may increase chromium absorption:
- Beta blockers
- Corticosteroids
- Insulin
- Nicotinic acid
- Nonsteroidal anti-inflammatory drugs
- Prostaglandin inhibitors (aspirin, indomethacin, ibuprofen)

The following medications alter stomach acidity and may impair chromium absorption or enhance excretion:
- Antacids
- Corticosteroids
- H2 blockers (such as cimetidine)
- Proton pump inhibitors (such as omeprazole)

**Fish Oil/Omega-3 Fatty Acids**

Fish oil or omega-3 fatty acids are important for a number of bodily functions, including the relaxation and contraction of muscles, blood clotting, digestion, fertility, cell division, growth and movement of calcium, and other substances in and out of cells. The three major types of omega-3 fatty acids are alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). ALA is converted into EPA and DHA, after it is ingested. Fish oil supplements in low to moderate doses may cause minor gastrointestinal upset. In high doses, they can interact with certain medications, including blood thinners and drugs used for high blood pressure.

**Omega-3 fatty acid EPA and DHA sources:**
- Mackerel
- Tuna
- Salmon
- Sturgeon
- Mullet
- Bluefish
- Anchovy
- Sardines
- Herring
- Trout
- Menhaden

**Omega-3 fatty acid ALA sources:**
- Seeds
- Vegetable oils (canola, flaxseed, and soybean)
- Green leafy vegetables
- Nuts and beans
Scientific evidence:

- Epidemiological studies done more than 30 years ago noted relatively low death rates due to cardiovascular disease in Eskimo populations with high fish consumption.
- Studies show that fish oil supplements are effective in reducing several cardiovascular disease risk factors and may help with some aspects of rheumatoid arthritis.
- Increasing levels of DHA and EPA, either by eating fish or taking fish oil supplements, lowers triglycerides, slightly lowers blood pressure, may slow the progression of atherosclerosis, and may reduce the risk of heart attack, stroke, and death among people with cardiovascular disease.

Folate

Folate is a water-soluble B vitamin that functions as a coenzyme in single-carbon transfers in the synthesis of nucleic acids (DNA and RNA) and the metabolism of amino acids. A form of folate, called folic acid, is used in dietary supplements and fortified foods.

Specific foods with the highest level of folate:

- Spinach
- Liver
- Yeast
- Asparagus
- Brussels sprouts

Folate and Health

- Modest doses of folic acid taken before preneoplastic lesions are established might suppress the development of cancer in normal tissues, whereas high doses taken after the establishment of preneoplastic lesions might promote cancer development and progression.
- Folic acid supplements with other B vitamins might provide protection from stroke.
- Low folate status has been linked to depression and poor response to antidepressants.
- Women who take folic acid periconceptionally reduce Neural Tube Defects (NTDs) by 50-60%.
- Folic acid supplementation has been shown to lengthen mean gestational age and lower the risk of pre-term birth. Research also suggests that folic acid, in combination with a multivitamin supplement, helps minimize the risk of congenital heart defects.
- Studies have also found associations between the use of folic acid in combination with multivitamin supplements and reduced occurrence at birth of urinary tract anomalies, oral facial clefts, limb defects, and hydrocephalus.
**Folate Cautions**

Methotrexate:
- Folate antagonist in high doses

Sulfasalazine:
- Inhibits the intestinal absorption of folate, potentially causing folate deficiency

Antiepileptic medications reduce serum folate levels and folic acid supplements can reduce antiepileptic medication serum levels.

**Glucosamine Sulphate**

Glucosamine sulphate and chondroitin sulfate are natural substances found in and around the cells of cartilage. Glucosamine is an amino sugar that the body produces and distributes in cartilage and other connective tissue. Chondroitin is a complex carbohydrate that helps cartilage retain water.

**Use of Glucosamine Sulphate**

There has been considerable interest in glucosamine and chondroitin sulfate as a treatment option for knee arthritis. The Glucosamine/Chondroitin Arthritis Intervention Trial (GAIT) is the first large-scale, multicenter clinical trial in the United States to test the effects of the dietary supplements for the treatment of knee osteoarthritis. The study revealed that patients who took the supplements of glucosamine and chondroitin (alone or in combination) had outcomes similar to those experienced by patients who took celecoxib or placebo pills.

People have tried glucosamine sulfate for glaucoma and for weight loss, but it has not been adequately studied for these uses.

**Iodine**

Iodine is a mineral and available in the form of potassium iodide or sodium iodide. The body needs iodine to make thyroid hormones that control the body's metabolism and for proper bone and brain development during pregnancy and infancy.

**Warnings:**
Women who are pregnant or breastfeeding need to get enough iodine for their babies to grow and develop properly. Severe iodine deficiency during childhood has harmful effects on the
development of the brain and nervous system. The effects of mild iodine deficiency during childhood are more difficult to measure, but mild iodine deficiency might cause subtle problems with neurological development. Iodine supplementation is recommended during pregnancy, lactation, and early childhood.

Very high doses of iodine supplements might reduce the pain and other symptoms of fibrocystic breast disease, but more study is necessary to confirm this.

People with iodine deficiency who are exposed to radioactive iodine are especially at risk of developing thyroid cancer.

Iodine foods:
- Fish (such as cod and tuna)
- Seaweed
- Shrimp and other seafood
- Dairy products (milk, yogurt, and cheese)
- Grains (like breads and cereals)
- Fruits and vegetables (depends on the iodine in the soil)
- Iodized salt

Cautions:
Getting high levels of iodine can cause some of the same symptoms as iodine deficiency:
- Goiter (an enlarged thyroid gland)
- Thyroid gland inflammation and thyroid cancer

Getting a very large dose of iodine (several grams, for example) can cause:
- Burning of the mouth, throat, and stomach
- Fever
- Stomach pain
- Nausea and vomiting
- Diarrhea
- Weak pulse
- Coma

Iodine Interactions

Anti-thyroid medications:
- Taken with high doses of iodine could cause your body to produce too little thyroid hormone.

ACE inhibitors and potassium-sparing diuretics:
- Taken with high doses of potassium iodide could raise the amount of potassium in your blood to an unsafe level.
**Test Yourself**

Foods containing Omega-3 fatty acids EPA and DHA are:

A. Seeds, vegetable oils, and green leafy vegetables.
B. Salmon, anchovy, and sardines.
C. Brewer’s yeast, red wine, and basil.

The correct answer is salmon, anchovy, and sardines.

**Iron**

Iron is one of the most abundant metals on Earth, yet considered the number one nutritional disorder in the world by the World Health Organization. Conversely, there is considerable potential for iron toxicity because very little iron is excreted from the body. Death has occurred in children ingesting 200 mg of iron.

Additionally, vitamin A limits the body’s ability to use stored iron (Vitamin A mobilizes iron from its storage sites).

Iron is an essential component of proteins involved in oxygen transport and regulates cell growth and differentiation. Iron in excess can result in toxicity and even death.

Three groups of people are most likely to benefit from iron supplements:

1. People with a greater need for iron
2. Individuals who tend to lose more iron
3. People who do not absorb iron normally such as:
   - Pregnant women
   - Pre-term and low birth weight infants
   - Older infants and toddlers
   - Teenage girls
   - Women of childbearing age, especially those with heavy menstrual losses
   - People with renal failure, especially those undergoing routine dialysis
   - People with gastrointestinal disorders who do not absorb iron normally

Signs of iron deficiency anemia:

- Feeling tired and weak
- Decreased work and school performance
- Slow cognitive and social development during childhood
- Difficulty maintaining body temperature
- Decreased immune function, which increases susceptibility to infection
• Glossitis (an inflamed tongue)
• Pica (eating nonnutritive substances such as dirt and clay)

*Pica: Researchers disagree about the cause of these associations. Pica may cause or be a sign of iron deficiency anemia.

Iron foods:
• Red meat
• Egg yolks
• Dark, leafy greens (spinach, collards)
• Dried fruit (prunes, raisins)
• Iron-enriched cereals and grains
• Mollusks (oysters, clams, scallops)
• Turkey or chicken giblets
• Beans, lentils, chick peas and soybeans
• Liver
• Artichokes

Iron supplement side effects:
• Constipation
• Nausea
• Vomiting
• Diarrhea

**Magnesium**

Magnesium is the fourth most abundant mineral in the body and is needed for more than 300 biochemical reaction including:
• To help maintain normal muscle and nerve function.
• To keep heart rhythm steady.
• To support a healthy immune system.
• To keep bones strong.
• To regulate blood sugar levels.
• To promote normal blood pressure.

Signs of magnesium deficiency include:
• Loss of appetite
• Nausea and vomiting
• Fatigue
• Weakness
• Numbness and tingling
• Muscle contractions and cramps
• Seizures
• Personality changes
• Abnormal heart rhythms
• Coronary spasms

Severe magnesium deficiency can result in low levels of calcium in the blood (hypocalcemia). Magnesium deficiency is also associated with low levels of potassium in the blood (hypokalemia).

Foods:
• Green vegetables such as spinach are good sources of magnesium because the center of the chlorophyll molecule (which gives green vegetables their color) contains magnesium
• Legumes (beans and peas)
• Nuts and seeds
• Whole, unrefined grains

Magnesium

Cautions:
• The following drugs increase the loss of magnesium in urine:
  o Loop and thiazide diuretics
  o Anti-neoplastic drugs
  o Antibiotics
• Magnesium binds tetracycline antibiotics in the gut and decreases the absorption of tetracycline
• Combining magnesium supplements with magnesium containing antacids and laxatives can inadvertently lead to excessive magnesium consumption

Multivitamins/Minerals (MVM’s)

Multivitamins contain a combination of vitamins and minerals to increases nutrient intakes when food alone does not meet these needs. Multivitamins cannot take the place of eating a variety of foods that are important to a healthy diet.

Evidence shows that high-dose formulas of several vitamins and minerals slowed vision loss in some people with age-related macular degeneration.
Multivitamins/Minerals Cautions

- If consuming fortified foods and drinks (such as cereals or beverages with added vitamins and minerals) or taking other dietary supplements, a MVM can cause the intake of any vitamin or mineral to go above the upper safe levels.
- Women who get too much vitamin A during pregnancy can increase the risk of birth defects in their babies.
- Adult men and postmenopausal women should avoid taking MVMs that contain 18 mg or more of iron unless their doctor has told them that they have iron deficiency or inadequacy.
- Any MVM or dietary supplement with vitamin K interacts with medications to reduce blood clotting, such as warfarin, by lowering the drug's effectiveness. Doctors base the medicine dose partly on the amount of vitamin K usually consumed in foods and supplements.

Probiotics

Probiotics are live microorganisms and are referred to as “friendly bacteria” or “good bacteria”. When administered in adequate amounts, probiotics bestow a health benefit on the host. Probiotics are not the same thing as prebiotics; the non-digestible food ingredients that selectively stimulate the growth of beneficial microorganisms already in the colon.

Most probiotics are bacteria similar to beneficial microorganisms found in the human gut, especially in those of breastfed infants. Most often, the bacteria come from two groups, lactobacillus or bifidobacterium. A few common probiotics, such as saccharomyces boulardii, are yeasts, which are different from bacteria. Some probiotic foods date back to ancient times, such as fermented foods and cultured milk products. Interest in probiotics in general has been growing.

People use probiotic products to treat certain illnesses and support general wellness. There is limited evidence supporting some uses of probiotics and much more scientific knowledge is needed about their safety and appropriate use. Additionally, effects found from one species of probiotics do not necessarily hold true for others, or even for different preparations of the same species.

Interactions between the microorganisms in the body and among the microorganisms themselves can be crucial to health and well-being. The balance of bacteria can be thrown off in two major ways:

1. By antibiotics which kill friendly and unfriendly bacteria. Some people use probiotics to try to offset side effects from antibiotics like gas, cramping, or diarrhea. Some use them to ease symptoms of lactose intolerance.
2. “Unfriendly” microorganisms such as disease-causing bacteria, yeasts, fungi, and parasites can also upset the balance.
Another point of interest regarding probiotics stems from the fact there are cells in the digestive tract connected with the immune system. One theory is that if you alter the microorganisms in a person’s intestinal tract, you can affect the immune system's defenses.

Foods:
- Yogurt
- Fermented and unfermented milk
- Miso
- Tempeh
- Some juices and soy beverages

**Probiotics: The Scientific Evidence**

Side effects, if they occur, tend to be mild and digestive such as gas or bloating. More serious effects have been seen in some people. Probiotics might theoretically cause infections that need to be treated with antibiotics, especially in people with underlying health conditions. They could also cause unhealthy metabolic activities, too much stimulation of the immune system, or gene transfer (insertion of genetic material into a cell).

Evidence supports probiotics (the specific formulations used in the studies) for:
- Diarrhea (especially from rotovirus)
- Urinary tract infections
- Irritable bowel syndrome
- Reduce recurrence of bladder cancer
- Decrease clostridium difficile intestinal infections
- Pouchitis (a condition that can follow colon removal surgery)
- Atopic dermatitis in children

Researchers are exploring whether probiotics could halt unfriendly agents in the first place or suppress their growth in conditions like:
- Infectious diarrhea
- Irritable bowel syndrome
- Inflammatory bowel disease
- Helicobacter pylori infection
- Tooth decay and periodontal disease
- Vaginal infections
- Stomach and respiratory infections from daycare
- Skin infections
Selenium

Selenium is a trace mineral that is essential to good health but required only in small amounts. Selenium is incorporated into proteins to make antioxidant enzymes that help prevent cellular damage from free radicals, help regulate thyroid function and play a role in the immune system.

Foods:
- Brazil nuts
- Shellfish
- Fish
- Sunflower seeds
- Grains
- Mushrooms
- Eggs
- Meat
- Poultry
- Onions

Scientific evidence:
- Observational studies indicate that death from cancer, including lung, colorectal, and prostate cancers, is lower among people with higher blood levels or intake of selenium.
- Selenium might affect cancer risk in two ways:
  1. Protecting the body from damaging effects of free radicals.
  2. Preventing or slowing tumor growth.
- Certain breakdown products of selenium are believed to prevent tumor growth by enhancing immune cell activity and suppressing development of blood vessels to the tumor.
- Selenium, as an antioxidant, may help to relieve symptoms of arthritis by controlling levels of free radicals.
- Antioxidant nutrients such as selenium help protect cells from oxidative stress, thus potentially slowing progression of HIV.

Selenium Deficiency

Selenium deficiency is rare in the United States. There is evidence that selenium deficiency does not usually cause illness by itself but makes the body more susceptible to illnesses caused by other nutritional, biochemical or infectious stresses. Selenium deficiency may also contribute to the development of heart disease, hypothyroidism, and a weakened immune system. In addition, severe gastrointestinal disorders may decrease the absorption of selenium.
Three specific diseases have been associated with selenium deficiency:

1. Keshan disease, which results in an enlarged heart and poor heart function, occurs in selenium deficient children.
2. Kashin-Beck disease, which results in osteoarthropathy.
3. Myxedematous endemic cretinism, which results in mental retardation.

Selenium supplement side effects:

- High blood levels of selenium can result in a condition called selenosis. Symptoms of selenosis include gastrointestinal upsets, hair loss, white blotchy nails, garlic breath odor, fatigue, irritability, and mild nerve damage.
- Brazil nuts contain very high amounts of selenium, so they should be consumed only occasionally and in small amounts.

**Test Yourself**

Probiotics are also known as:

- A. “Active bacteria”
- B. “Helpful bacteria”
- C. “Friendly bacteria”

The correct answer is C: “friendly bacteria”.

**Vitamin A**

Vitamin A is a fat-soluble vitamin that is naturally present in many foods and important for:

- Normal vision
- The immune system
- Reproduction
- Proper functioning of the heart, lungs, kidneys, and other organs

Certain groups of people are more likely than others to have trouble getting enough vitamin A:

- Premature infants
- People with cystic fibrosis

Foods:

- Beef liver and other organ meats
- Fish, such as salmon
- Green leafy vegetables and orange and yellow vegetables
- Fruits (cantaloupe, apricots, and mangos)
- Dairy products
Deficiency:
Vitamin A deficiency is common in poorer countries but rarely seen in more developed countries. People who eat a lot of foods containing beta-carotene (antioxidant converted to vitamin A in the body) might have a lower risk of certain kinds of cancer, such as lung cancer or prostate cancer. Additionally, smokers who take high doses of beta-carotene supplements have an increased risk of lung cancer. Supplements containing large doses of beta-carotene combined with other antioxidants, zinc, and copper has shown promise for slowing down the rate of vision loss in age-related macular degeneration.

Cautions:
Getting too much preformed vitamin A (usually from supplements or certain medicines) can cause dizziness, nausea, headaches, coma, and even death. High intakes of preformed vitamin A in pregnant women can also cause birth defects in their babies. Women who might be pregnant should not take high doses of vitamin A supplements. Consuming high amounts of beta-carotene or other forms of provitamin A can turn the skin yellow-orange, but this condition is harmless.

Medication interactions:
- Orlistat (Alli®, Xenical®), a weight-loss drug, can decrease the absorption of vitamin A.
- Several synthetic forms of vitamin A are used in prescription medicines. Examples are the psoriasis treatment acitretin (Soriatane®) and bexarotene (Targretin®), used to treat the skin effects of T-cell lymphoma. Taking these medicines in combination with a vitamin A supplement can cause dangerously high levels of vitamin A in the blood.

Vitamin B₁₂

Vitamin B₁₂ helps keep the body's nerve and blood cells healthy and helps make DNA. Two steps are required for the body to absorb vitamin B₁₂ from food. First, hydrochloric acid in the stomach separates vitamin B₁₂ from the protein to which vitamin B₁₂ is attached in food. After this, vitamin B₁₂ combines with a protein made by the stomach called intrinsic factor and is absorbed by the body. In pernicious anemia, the body cannot make intrinsic factor. As a result, they have trouble absorbing vitamin B₁₂ from all foods and dietary supplements.

Foods:
- Beef liver
- Clams (best source)
- Fish
- Meat
- Poultry
- Eggs
- Dairy products
- Nutritional yeasts (fortified with vitamin B₁₂)
Scientific evidence:

- Vitamin B\textsubscript{12} supplements (along with folic acid and vitamin B\textsubscript{6}) do not reduce the risk of getting heart disease.
- Individuals with dementia often have high levels of homocysteine in the blood. Vitamin B\textsubscript{12} (with folic acid and vitamin B\textsubscript{6}) can lower homocysteine levels.
- There is no evidence that shows that vitamin B\textsubscript{12} supplements increase energy or improve athletic performance, except in people with a vitamin B\textsubscript{12} deficiency.

Vitamin B\textsubscript{12} Deficiency Symptoms

Adults:

- Tiredness
- Weakness
- Constipation
- Loss of appetite
- Weight loss
- Megaloblastic anemia
- Nerve problems
- Problems with balance
- Depression
- Confusion
- Dementia
- Poor memory
- Soreness of the mouth or tongue

Infants:

- Failure to thrive
- Problems with movement
- Delays in reaching developmental milestones
- Megaloblastic anemia

Certain groups may not get enough vitamin B\textsubscript{12} or have trouble absorbing it:

- Older adults who do not have enough hydrochloric acid in their stomach to absorb the vitamin B\textsubscript{12} naturally present in food. People over 50 should get most of their vitamin B\textsubscript{12} from fortified foods or dietary supplements because, in most cases, their bodies can absorb vitamin B\textsubscript{12} from these sources.
- People with pernicious anemia whose bodies do not make the intrinsic factor needed to absorb vitamin B\textsubscript{12}. 
- People who have had gastrointestinal surgery, such as weight loss surgery, or who have digestive disorders, such as celiac disease or Crohn's disease. These conditions can decrease the amount of vitamin B₁₂ that the body can absorb.
- Individuals who eat little or no animal foods such as vegetarians and vegans.

**Vitamin B₁₂ Cautions**

- Vitamin B₁₂ deficiency can damage the nervous system even in people who don't have anemia, so it is important to treat a deficiency as soon as possible.
- Large amounts of folic acid can hide a vitamin B₁₂ deficiency by correcting megaloblastic anemia, a hallmark of vitamin B₁₂ deficiency. But folic acid does not correct the progressive damage to the nervous system that vitamin B₁₂ deficiency also causes. For this reason, healthy adults should not get more than 1,000 mcg of folic acid a day.

The following medicines can interfere with the body's absorption or use of vitamin B₁₂:
- Chloramphenicol (Chloromycetin®), an antibiotic that is used to treat certain infections.
- Proton pump inhibitors, such as omeprazole (Prilosec®) and lansoprazole (Prevacid®), that are used to treat acid reflux and peptic ulcer disease.
- Histamine H₂ receptor antagonists, such as cimetidine (Tagamet®), famotidine (Pepcid®), and ranitidine (Zantac®), that are used to treat peptic ulcer disease.
- Metformin, a drug used to treat diabetes.

**Vitamin B₆**

The body needs vitamin B₆ for more than 100 enzyme reactions involved in metabolism. Vitamin B₆ is also involved in brain development during pregnancy and infancy as well as immune function.

Some studies show that vitamin B₆ supplements could reduce PMS symptoms including moodiness, irritability, forgetfulness, bloating, and anxiety. Additionally, The American Congress of Obstetricians and Gynecologists (ACOG) recommend taking vitamin B₆ supplements under a doctor's care for nausea and vomiting during pregnancy.

Taking high levels of vitamin B₆ from supplements for a year or longer can cause:
- Severe nerve damage, leading people to lose control of their bodily movements
- Painful, unsightly skin patches
- Extreme sensitivity to sunlight
- Nausea
- Heartburn

Foods:
• Poultry
• Fish
• Organ meats
• Potatoes and other starchy vegetables
• Fruit (other than citrus)

B6 supplements can interact or interfere with medicines that you take. Here are several examples:
• Vitamin B6 supplements might interact with cycloserine (Seromycin®), an antibiotic used to treat tuberculosis, and worsen any seizures and nerve cell damage that the drug might cause.
• Taking certain epilepsy drugs could decrease vitamin B6 levels and reduce the drugs' ability to control seizures.
• Taking theophylline (Aquaphyllin®, Elixophyllin®, Theolair®, Truxophyllin®, and many others) for asthma or another lung disease can reduce vitamin B6 levels and cause seizures.

Vitamin B6 Deficiency

People with the following conditions are more likely to have trouble getting enough vitamin B6:
• Kidney disease
• Autoimmune disorders such as rheumatoid arthritis, celiac disease, Crohn's disease, ulcerative colitis, or inflammatory bowel disease
• Alcoholism

Deficiency signs and symptoms:

Adults:
• Anemia
• Itchy rashes
• Scaly skin on the lips
• Cracks at the corners of the mouth
• Swollen tongue
• Depression
• Confusion
• Weak immune system

Infants:
• Irritability
• Extremely sensitive hearing
• Seizures
Vitamin C

Vitamin C, also known as ascorbic acid, is a water-soluble nutrient that acts as an antioxidant, helping to protect cells from the damage caused by free radicals. The body needs vitamin C to make collagen, a protein required to help wounds heal. Also, vitamin C improves the absorption of iron from plant-based foods and helps the immune system work properly to protect the body from disease. Reported side effects of vitamin C supplements include diarrhea, nausea, and stomach cramps.

Foods:
- Citrus fruits (such as oranges and grapefruit)
- Red and green pepper
- Kiwi fruit
- Broccoli
- Strawberries
- Cantaloupe
- Baked potatoes
- Tomatoes
- Foods and beverages that are fortified with vitamin C

*The vitamin C content of food may be reduced by prolonged storage and by cooking. Steaming or microwaving may lessen cooking losses.

Certain groups of people are more likely to have trouble getting enough vitamin C:
- Smokers and those who are exposed to secondhand smoke (smoke increases the amount of vitamin C that the body needs to repair damage caused by free radicals)
- Infants who are fed evaporated or boiled cow's milk (cow's milk has very little vitamin C and heat can destroy vitamin C)
- People who eat a very limited variety of food
- People with severe malabsorption, some types of cancer, and kidney disease requiring hemodialysis

Little or no vitamin C (below about 10 mg per day) for many weeks can cause scurvy which can be fatal if not treated. The signs of scurvy are:
- Fatigue
- Small red or purple spots on the skin
- Joint pain
- Poor wound healing
- Swollen, bleeding gums
- Loosening or loss of teeth
- Corkscrew hairs
- Depression
- Anemia
Vitamin C: Eat Your Fruits and Vegetables

- People with high intakes of vitamin C from fruits and vegetables might have a lower risk of getting many types of cancer, such as lung, breast, and colon cancer. However, taking vitamin C supplements, with or without other antioxidants, doesn’t seem to protect people from getting cancer. Eating lots of fruits and vegetables rich in vitamin C also seems to reduce the risk of cardiovascular disease.
- A few studies in animals and test tubes indicate that very high blood levels of vitamin C might shrink tumors. But more research is needed to determine whether high-dose intravenous vitamin C helps treat cancer in people.
- Research suggests that vitamin C combined with other nutrients might help keep early age-related macular degeneration (AMD) from worsening into advanced AMD.
- People who take vitamin C supplements regularly might have slightly shorter colds or somewhat milder symptoms when they do have a cold.

Cautions:
- In hemochromatosis, a condition that causes the body to store too much iron, high doses of vitamin C could worsen iron overload and damage body tissues.
- Vitamin C dietary supplements can interact or interfere with medications. Here are several examples:
  - Chemotherapy and radiation therapy.
  - In one study, vitamin C plus other antioxidants (such as vitamin E, selenium, and beta-carotene) reduced the heart-protective effects of two drugs taken in combination (a statin and niacin) to control blood-cholesterol levels. It is not known whether this interaction also occurs with other statins. People who eat lots of fruits and vegetables seem to have a lower risk of cardiovascular disease.

Vitamin D

Vitamin D is a nutrient from sun, food, and supplements. Vitamin D helps the body to:
- Absorb calcium from food and supplements
- Maintain strong bones
- Move muscles
- Carry messages between nerves and brain
- Fight off invading bacteria and viruses

Too little vitamin D can cause rickets (soft, thin, and brittle bones) in children and osteomalacia in adults.

Very few foods naturally have vitamin D. Fortified foods provide most of the vitamin D in American diets.
Vitamin D foods:
- Fatty fish
- Beef liver, cheese, and egg yolks
- Mushrooms
- Almost all of the U.S. milk supply is fortified with 400 IU of vitamin D per quart
- Vitamin D is added to many breakfast cereals and to some brands of orange juice, yogurt, margarine, and soy beverages

Groups that may not get enough vitamin D:
- Breastfed infants, since human milk is a poor source of the nutrient.
- Older adults, since their skin doesn't make vitamin D when exposed to sunlight as efficiently as when they were young. Their kidneys are also less able to convert vitamin D to its active form.
- People with dark skin, because their skin has less ability to produce vitamin D from the sun.
- People with disorders such as Crohn's disease or celiac disease who don't handle fat properly, because vitamin D needs fat to be absorbed.
- Obese people, because their body fat binds to some vitamin D and prevents it from getting into the blood.

The body makes vitamin D when skin is directly exposed to the sun. Exposure to sunshine indoors through a window will not produce vitamin D. Cloudy days, shade, and having dark-colored skin also decreases the amount of vitamin D the skin makes.

Scientific evidence:
- Supplements of both vitamin D and calcium have been shown to reduce the risk of bone loss and fractures in elderly people aged 62-85 years.
- Some studies suggest that vitamin D may protect against colon cancer and perhaps even cancers of the prostate and breast. But higher levels of vitamin D in the blood have also been linked to higher rates of pancreatic cancer. At this time, it's too early to say whether low vitamin D status increases cancer risk and whether higher levels protect or even increase risk in some people.
- Vitamin D is also being studied for its possible connections to several diseases and medical problems, including diabetes, hypertension, and autoimmune conditions such as multiple sclerosis.

Vitamin D may interact or interfere with other medicines or supplements. Here are several examples:
- Corticosteroids impair how the body handles vitamin D, which leads to lower calcium absorption and loss of bone over time.
• Both the weight-loss drug orlistat (brand names Xenical® and Alli®) and the cholesterol-lowering drug cholestyramine (brand names Questran®, LoCholest®, and Prevalite®) can reduce the absorption of vitamin D and other fat-soluble vitamins (A, E, and K).

• Both phenobarbital and phenytoin (brand name Dilantin®), increase the breakdown of vitamin D and reduce calcium absorption.

Signs of vitamin D toxicity include:
• Nausea
• Vomiting
• Constipation
• Weakness
• Loss of appetite
• Weight loss
• Kidney damage

Vitamin E

Vitamin E is a fat-soluble nutrient and antioxidant that helps to protect cells from the damage caused by free radicals. Two main things to consider when choosing a vitamin E supplement are:

1. The doses in vitamin E-only supplements are much higher than the recommended amounts.
2. The natural form (d-alpha-tocopherol) is more potent than the synthetic form (dl-alpha-tocopherol).

Deficiency:
Vitamin E deficiency is almost always linked to certain diseases where fat is not properly digested or absorbed. Examples include Crohn's disease, cystic fibrosis, and certain rare genetic diseases such as abetalipoproteinemia and ataxia with vitamin E deficiency (AVED). The signs of vitamin E deficiency are nerve and muscle damage and a weakened immune system.

Foods:
• Vegetable oils
• Nuts and seeds
• Green vegetables

Scientific evidence:
• Vitamin E has blood-thinning effects.
• Links between higher intakes of vitamin E from supplements and lower chances of developing heart disease. However, the best research shows that Vitamin E does not seem to prevent heart disease, reduce its severity, or affect the risk of death from this disease.
• Vitamin E does not help prevent cancer and may be harmful in some cases. A large study found that taking vitamin E supplements for several years increased the risk of developing prostate cancer in men. Two studies found that extra vitamin E did not protect from any form of cancer. However, one study found a link between the use of vitamin E supplements for 10 years or more and a lower risk of death from bladder cancer.
• Vitamin E combined with other antioxidants, zinc, and copper shows promise for slowing down the rate of vision loss among people with early stage AMD.
• Little evidence of benefit in healthy people or people with mild mental functioning problems attempting to maintain brain health.

Side effects:

In high doses:
• Increase risk of bleeding
• Hemorrhagic stroke

Below upper safe levels:
• Increase risk of prostate cancer
• Increase risk of death in some adults with chronic health conditions

Cautions:
Vitamin E dietary supplements can interact or interfere with certain medicines. Here are some examples:
• Increased risk of bleeding in people taking anticoagulant or antiplatelet medicines, such as warfarin (Coumadin®). Vitamin E intakes above 1,000 International Units (IU) per day may increase the risk of excess bleeding.
• Vitamin E plus other antioxidants (such as vitamin C, selenium, and beta-carotene) can reduce the effects of a statin and niacin combination.
• Antioxidant supplements could alter the effectiveness of chemotherapy or radiation therapy.

Vitamin K

Vitamin K is a fat-soluble vitamin stored in fat tissue and in the liver. Chlorophyll, the substance in plants that provides the green color, also provides vitamin K.

Vitamin K helps blood coagulate and plays an important role in bone health.

Foods:
• Beef liver
• Green tea
• Turnip greens
• Broccoli
• Kale
• Spinach
• Cabbage
• Asparagus
• Dark green lettuce

*Freezing foods may destroy vitamin K, but heating does not affect it.

It is rare to have a vitamin K deficiency. That’s because in addition to being found in leafy green foods, the bacteria in your intestines can make vitamin K. Sometimes taking antibiotics can kill the bacteria and lead to a mild deficiency, mostly in people that begin with low levels. Vitamin K deficiency can lead to excessive bleeding, which may begin as oozing from the gums or nose.

Things that may lead to vitamin K deficiency include:
• Health problems that can prevent your body from absorbing vitamin K, such as gallbladder or biliary disease, cystic fibrosis, celiac disease, and Crohn's disease
• Liver disease
• Taking blood-thinners
• Long-term hemodialysis
• Serious burns

**Vitamin K: Who should be taking it?**

Conditions that benefit from vitamin K include:
• Vitamin K is used to reduce the risk of bleeding in liver disease, conditions where your body does not absorb enough vitamin K, or if you take antibiotics for a long time.
• Even though vitamin K deficiency in newborns is very rare, all newborns receive vitamin K injections to prevent the possibility of bleeding, particularly in the brain. Babies are born without any bacteria in their intestines and do not get enough vitamin K from breast milk to tide them over until their bodies are able to make it.
• There is increasing evidence that vitamin K improves bone health and reduces risk of bone fractures, particularly in postmenopausal women who are at risk for osteoporosis.

Cautions:
• When taking warfarin (Coumadin), it is important to keep vitamin K intake as consistent as possible. Sudden increases in vitamin K intake may decrease the effect of warfarin (Coumadin) and sudden decreases in vitamin K intake could increase the effect of warfarin (Coumadin).
• Cephalosporins (antibiotics) reduce the absorption of vitamin K in the body. Using them for more than 10 days may lower levels of vitamin K because these drugs kill not only harmful bacteria but also the bacteria that make vitamin K. People who already have
low levels of vitamin K, such as those who are malnourished, elderly, or taking warfarin (Coumadin) are at greater risk.

- People with a rare metabolic condition called Glucose-6-phosphate dehydrogenase (G6PD) deficiency should avoid vitamin K.
- Phenytoin (Dilantin) interferes with the body's ability to use vitamin K. Taking anticonvulsants (such as phenytoin) during pregnancy or while breastfeeding may lower vitamin K in newborns.
- Orlistat, a medication used for weight loss, and olestra, a substance added to some foods, lowers the amount of fat your body can absorb. Because vitamin K is a fat-soluble vitamin, these medications may also lower levels of vitamin K. The Food and Drug Administration now requires that vitamin K and other fat-soluble vitamins (A, D, and E) be added to food products containing olestra.
- Bile acid sequestrants, such as Cholestyramine (Questran), Colestipol (Colestid) and Colsevelam (Welchol), reduce cholesterol and reduce fat absorbed by the body and may also reduce absorption of fat-soluble vitamins.

**Zinc**

Zinc is a nutrient found in cells throughout the body that helps:
- The immune system fight invading bacteria and viruses
- To make proteins and DNA
- The body to grow and develop properly during pregnancy, infancy, and childhood
- Wounds heal
- The development of taste and smell senses

**Foods:**
- Oysters (best source)
- Red meat
- Poultry
- Crab
- Lobster
- Beans
- Nuts
- Whole grains
- Dairy products

**Zinc deficiency causes:**
- Slow growth in infants and children
- Delayed sexual development in adolescents and impotence in men
- Hair loss
- Diarrhea
- Eye and skin sores
• Loss of appetite
• Weight loss
• Problems with wound healing
• Decreased ability to taste food
• Lower alertness levels

Certain groups of people are more likely than others to have trouble getting enough zinc:
• Gastrointestinal surgery or digestive disorders can decrease the amount of zinc that the body absorbs and increase the amount lost in the urine.
• Vegetarians do not consume meat, a good source of zinc and typically consume beans and grains that have compounds that keep zinc from being fully absorbed by the body. For this reason, vegetarians might need to eat as much as 50% more zinc than the recommended amounts.
• Alcoholics because alcoholic beverages decrease the amount of zinc that the body absorbs and increase the amount lost in the urine.
• Sickle cell disease.

Scientific evidence:
• Older people who have low levels of zinc might have a higher risk of getting pneumonia and other infections.
• Some people who have skin ulcers might benefit from zinc dietary supplements if they have low levels of zinc.
• Some studies suggest that zinc lozenges or syrup (but not zinc dietary supplements in pill form) help speed recovery from the common cold and reduce its symptoms if taken within 24 hours of coming down with a cold.
• Research suggests that zinc might help keep early age-related macular degeneration (AMD) from worsening into advanced AMD.
• Scientists are studying zinc to learn about its effects on the immune system. Scientists are also researching possible connections between zinc and the health problems discussed below.

Signs of too much zinc include:
• Nausea
• Vomiting
• Loss of appetite
• Stomach cramps
• Diarrhea
• Headaches
• Low copper levels
• Lower immunity
• Low levels of HDL cholesterol (the "good" cholesterol)
Zinc can interact or interfere with medicines and, in some cases, medicines can lower zinc levels in the body. Here are several examples:

- Quinolone or tetracycline antibiotics (such as Cipro®, Achromycin®, and Sumycin®) reduce the amount of both zinc and the antibiotic that the body absorbs. Taking the antibiotic at least two hours before or 4-6 hours after taking a zinc dietary supplement helps minimize this effect.

- Zinc dietary supplements can reduce the amount of penicillamine (a drug used to treat rheumatoid arthritis) that the body absorbs and decreases the medication’s effectiveness. Taking zinc dietary supplements at least two hours before or after taking the penicillamine helps minimize this effect.

- Thiazide diuretics, such as chlorthalidone (brand name Hygroton®) and hydrochlorothiazide (brand names Esiidrix® and HydroDIURIL®) increase the amount of zinc lost in the urine. Taking thiazide diuretics for a long time could decrease the amount of zinc in the body.

**Mind-Body Interventions**

Mind-body medicine focuses on the interactions among the brain, mind, body, and behavior, and on the powerful ways in which emotional, mental, social, spiritual and behavioral factors can directly affect health (NIH).

In traditional Chinese medicine, the mind is important in the treatment of illness and is integral to the healing approaches.

The history of the mind-body connection:

- 400 B.C.: Hippocrates recognized the moral and spiritual aspects of healing, believing that treatment could occur only with consideration of attitude, environmental influences, and natural remedies.
- 1920s: Walter Cannon coined the phrase “fight or flight” revealing the direct relationship between stress and neuroendocrine responses in animals.
- 1936: Hans Selye further defined the harmful effects of stress and distress on health.
- 1955: Dr. Henry Beecher coined the term “placebo effect” after he discovered that pain could be controlled by saline injections when morphine was in short supply.

Scientific evidence:

- Effective in the treatment of coronary artery disease, enhancing the effect of standard cardiac rehabilitation in reducing all-cause mortality and cardiac event recurrences for up to two years.
- Effective adjunct in the management of arthritis, with reductions in pain maintained for up to four years and reductions in the number of physician visits.
- Effectiveness in pain management of headaches and low-back pain.
• Can improve mood, quality of life and coping, as well as ameliorate disease and treatment-related symptoms in the treatment of cancer.
• Positive effects on psychological functioning and quality of life and may be particularly helpful for patients coping with chronic illness and in need of palliative care.
• Mind-body interventions can alter various immune parameters, but it is unclear whether these alterations are of sufficient magnitude to have an impact on disease progression or prognosis.

**Mind-Body Interventions and Stress**

• There is considerable evidence that emotional traits, both negative and positive, influence people’s susceptibility to infection. Following systematic exposure to a respiratory virus in the laboratory, individuals who report higher levels of stress or negative moods have been shown to develop more severe illness than those who report less stress or more positive moods.
• Negative mood or stress is associated with slow wound healing.
• Mind-body therapy can decrease the stress associated with surgery and promote a faster recovery time.
  o Initial randomized controlled trials, in which some patients received audiotapes with mind-body techniques (guided imagery, music, and instructions for improved outcomes) and some patients received control tapes found that subjects receiving mind-body intervention recovered more quickly and spent fewer days in the hospital.
  o Pain increased linearly with procedure time in a control group and in a group practice structured attention, but remained flat in a group practicing a self-hypnosis technique. The self-administration of analgesic drugs was significantly higher in the control group than in the attention and hypnosis groups.

**Test Yourself**

Please select all answers that apply to the following statement:

Research on mind-body interventions supports that it:

A. Can improve mood, quality of life, and coping, as well as ameliorate disease and treatment-related symptoms in the treatment of cancer.
B. Can heal disease.
C. Is effective in the treatment of coronary artery disease, enhancing the effect of standard cardiac rehabilitation in reducing all-case mortality and cardiac event recurrences for up to two years.
All of the above are correct except B, mind-body interventions cannot heal disease.

**Meditation Uses**

Learning to focus attention and becoming mindful of thoughts, feelings, and sensations is believed to result in a state of greater calmness, physical relaxation, and psychological balance.

The practice of meditation can change how a person relates to the flow of emotions and thoughts.

People use meditation for various health problems, such as:
- Anxiety
- Pain
- Depression
- Stress
- Insomnia
- Physical or emotional symptoms that may be associated with chronic illnesses (such as heart disease, HIV/AIDS, and cancer) and their treatment.

**How Does Meditation Work?**

Meditation reduces activity in the sympathetic nervous system and increases activity in the parasympathetic nervous system.
- The **sympathetic nervous system** helps mobilize the body for action. When a person is under stress, it produces the "fight-or-flight response" in which the heart rate and breathing rate go up and blood vessels narrow (restricting the flow of blood).
- The **parasympathetic nervous system** causes the heart rate and breathing rate to slow down, the blood vessels to dilate (improving blood flow), and the flow of digestive juices increases.

Meditation improves the mind’s ability to pay attention. Since attention is involved in performing everyday tasks and regulating mood, meditation might lead to other benefits.

Meditation increases antibody titers to influenza vaccine, suggesting potential linkage to improved immune function.

Scientists are using sophisticated tools to determine whether meditation is associated with significant changes in brain function. A number of researchers believe that these changes account for many of meditation's effects.

Most types of meditation have four elements in common:
1. A **quiet location** with as few distractions as possible.
2. **A specific, comfortable posture** that may consist of sitting, lying down, standing, walking, or in other positions.

3. **A focus of attention** which may include a mantra (a specially chosen word, sound, or phrase), an object, or the sensations of the breath.

4. **An open attitude** and letting distractions come and go naturally without judging them or suppressing them, but observing them and gently returning to focus.

**Reflection:**
What is your mantra? What word, phrase, sound, object, or sensation resonates with you? How can this CAM be used in your practice?

**Test Yourself**

Match the four elements of meditation with the corresponding description:

A. A quiet location  
B. A specific, comfortable posture  
C. A focus of attention  
D. An open attitude

1. May include a mantra (a specially chose word, sound, or phrase), an object, or the sensations of the breath.  
2. With as few distractions as possible.  
3. That may consist of sitting, lying down, standing, walking, or in other positions.  
4. Letting distractions come and go naturally without judging them or suppressing them, but observing them and gently returning to focus.

The correct matches are A = 2, B = 3, C = 1, D = 4

**What is Guided Imagery?**

Guided imagery is a **form of directed meditation** that guides the individual through calming or helpful mental images by following along with a description of a peaceful place or calming scene, healing process, or other guided images through written, video, or audio script.

- Guided imagery is done in a relaxed state that is entered through focused breathing. This relaxed state can also be brought forth through progressive muscular relaxation techniques. These is done by going through every muscle group taking time to first tense and squeeze each muscle followed by releasing the tension.
- The mind is then guided in a specific and special process that is similar to daydreaming. For example, a guided imagery exercise might ask you to focus on a setting or
environment that feels safe and comfortable. This can be experienced and accomplished by mentally seeing the setting, feeling, or sensing the environment, or using the senses of sound or smell.

Hypnosis: The Altered State of Consciousness

The term "hypnosis" comes from the Greek word hypnos, meaning "sleep." Hypnotherapists use exercises that bring about deep relaxation and an altered state of consciousness. A person in a deeply focused state is unusually responsive to an idea or image, but this does not mean that a hypnotist can control the person's mind and free will. On the contrary, hypnosis can actually teach people how to master their own states of awareness. By doing so they can affect their own bodily functions and psychological responses.

The History of Hypnosis

Hypnosis was first associated with the work of an Austrian physician named Franz Anton Mesmer. In the 1700s, Mesmer believed that illnesses were caused by magnetic fluids in the body getting out of balance. He used magnets and other hypnotic techniques (the word mesmerized comes from his name) to treat people.

Hypnotherapy regained popularity in the mid 1900's due to Milton H. Erickson (1901-1980), a successful psychiatrist who used hypnosis in his practice. In 1958, both the American Medical Association and the American Psychological Association recognized hypnotherapy as a valid medical procedure. Since 1995, the National Institutes of Health (NIH) has recommended hypnotherapy as a treatment for chronic pain.

How Does Hypnosis Work?

When something happens to us, we remember it and learn a particular behavior in response to what happened. Each time something similar happens, our physical and emotional reactions attached to the memory are repeated. In some cases, these reactions are unhealthy. In some forms of hypnotherapy, a trained therapist guides you to remember the event that led to the first reaction, separate the memory from the learned behavior, and replace unhealthy behaviors with new, healthier ones.

During hypnosis, the body relaxes and the thoughts become more focused. Like other relaxation techniques, hypnosis lowers blood pressure and heart rate, and changes certain types of brain wave activity. In this relaxed state, the body is physically at ease, yet fully awake mentally and may be highly responsive to suggestion. The conscious mind becomes less alert and the subconscious mind becomes more focused.

A hypnotherapist can teach individuals self-regulation skills. For instance, someone with arthritis may learn to turn down pain like the volume on a radio. Hypnotherapy can also be
used to help manage chronic illness. Self-hypnosis can enhance a sense of control, which is often lacking when someone has a chronic illness.

**Stages of Hypnosis**

There are several stages of hypnosis:

- Reframing the problem
- Becoming relaxed, then absorbed (deeply engaged in the words or images presented by a hypnotherapist)
- Dissociating (letting go of critical thoughts)
- Responding (complying with a hypnotherapist's suggestions)
- Returning to usual awareness
- Reflecting on the experience

**Hypnosis: The Scientific Evidence**

- Studies show that dental patients who underwent hypnosis had a significantly higher threshold for pain than those who were not hypnotized.
- Clinical trials on burn patients suggest that hypnosis decreases pain (enough to replace pain medication) and speeds healing.
- Clinical studies show that using hypnosis may reduce the need for medication, improve mental and physical condition before an operation, and reduce the time it takes to recover.
- Clinical studies on children in emergency treatment centers show that hypnotherapy reduces fear, anxiety, and discomfort.

**What Illnesses or Conditions Respond Well to Hypnosis?**

Other problems or conditions that may respond to hypnotherapy include:

<table>
<thead>
<tr>
<th>Irritable bowel syndrome</th>
<th>Addictions</th>
<th>Tinnitus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension headaches</td>
<td>Bedwetting</td>
<td>Cancer related pain</td>
</tr>
<tr>
<td>Alopecia areata</td>
<td>Fibromyalgia</td>
<td>Weight loss</td>
</tr>
<tr>
<td>Asthma</td>
<td>Labor and delivery</td>
<td>Eating disorders</td>
</tr>
<tr>
<td>Phobias</td>
<td>Skin disorders</td>
<td>Warts</td>
</tr>
<tr>
<td>Insomnia</td>
<td>Stress</td>
<td>Indigestion</td>
</tr>
</tbody>
</table>
How Can I Find a Hypnotherapist?

Most hypnotherapists are licensed medical doctors, registered nurses, social workers, or family counselors who have received additional training in hypnotherapy. For example, members of the American Society of Clinical Hypnosis (ASCH) must hold a doctorate in medicine, dentistry, podiatry, or psychology, or a master’s level degree in nursing, social work, psychology or marital/family therapy with at least 20 hours of ASCH approved training in hypnotherapy. The American Psychotherapy and Medical Hypnosis Association provide certificates for licensed medical and mental health professionals who complete a 6-8 week course.

To receive a directory of hypnotherapies near you, contact:
- The American Society of Clinical Hypnosis: www.asch.net
- The Society for Clinical and Experimental Hypnosis: www.sceh.us
- The American Association of Professional Hypnotherapists: www.aaph.org

Yoga: The State of Union

Yoga is a mind and body practice with origins in ancient Indian philosophy. The word yoga is derived from the root yuj, meaning either natural state of the spiritual self or union, depending upon context.

There are eight limbs or foundations of yoga practice that serve as spiritual guidelines:
1. Yama (moral behavior, restraint)
2. Niyama (observance, healthy habits)
3. Asana (physical posture)
4. Pranayama (regulation of breath)
5. Pratyahara (sense withdrawal)
6. Dharana (focus/concentration)
7. Dhyana (meditation)
8. Samadhi (total absorption, higher consciousness)

Yoga Posture and Breathing

Hatha, most commonly practiced in the United States and Europe, emphasizes two of the eight limbs; Asana (physical posture) and Pranayama (regulation of breathing).

Asana (physical posture)
- Posture must be steady and comfortable
- Asana implies a seated posture suitable for meditation, for example the lotus:
  o Steady = no shaking or trembling, firm
Comfortable posture needed for steadiness of breath and stillness of the mind
In Hatha yoga, asana is practiced to develop a strong and flexible body resulting in comfortable and steady seated posture


Pranayama (regulation of breathing)
Diaphragmatic breathing automatically stimulates the parasympathetic nervous system relieving tension and calming the nerves.

Breath is the manifestation of prana, the life force or the link between the body and the mind. All activities of the mind are controlled by prana. If prana is controlled, so is the mind.


Yoga Side Effects and Risks

Yoga is safe in healthy people when practiced appropriately. However, people with the following medical conditions should refrain from some yoga practices as they could complicate or cause further discomfort:

- Disc disease of the spine
- Extremely high or low blood pressure
- Glaucoma
- Retinal detachment
- Fragile or atherosclerotic arteries
- Risk of blood clots
- Ear problems
- Severe osteoporosis
- Cervical spondylitis (avoid inverted poses)

The research suggests that yoga might:
- Improve mood and sense of well-being
- Counteract stress
- Reduce heart rate and blood pressure
- Increase lung capacity
- Improve muscle relaxation and body composition
- Help with anxiety, depression, insomnia
- Improve overall physical fitness, strength, and flexibility
- Positively affect levels of certain brain or blood chemicals

Training, Licensing, and Certification

- There are many training programs in the United States, ranging from a few days to two years.
- The standards for teacher training differ depending on the style of yoga to be practiced.
- No official or well-accepted licensing requirements for yoga teachers in the United States.

Test Yourself

Which of the following accurately describes asana and pranayama in hatha yoga?
A. Asana is physical posture and pranayama is regulation of breathing.
B. Asana is regulation of breathing and pranayama is physical posture.
C. Asana and pranayama represent two of the 12 limbs.

The correct answer is A, asana is physical posture and pranayama is regulation of breathing.

Patient Assessment and Education

Medical education is under constant pressure to evolve. The changes in the medical interview over the past few years mirror this evolution. For example, human sexual behavior, resuscitation preferences, and domestic violence were considered taboo in the physician-patient dialogue and now these topics are now mandatory as a part of responsible medical care.
The rapid increase of public interest in and use of complementary and alternative therapies is likewise exerting a powerful influence on medical education. The potential drug interactions between herbal therapies, nutritional supplements, and medications urges even more action in the area of patient education.

**Increasing Awareness of CAM**

A survey of health food stores customers found that although these CAM consumers welcomed a partnership with their physicians, conventional health professionals must make significant efforts to open the lines of communication with their patients about their use of CAM approaches and products.

Recently, a major effort has been made to increase conventional physicians' awareness and understanding of CAM through educational programs. However, there is a great deal of variability in the content of these programs. Although a few provide detailed information on potential CAM benefits and safety issues, most are too general in content to provide physicians with the knowledge base they need to feel more comfortable about the subject and to display a willingness to discuss CAM issues with their patients.

**Additional Challenges of CAM Therapies**

- 33% of people who use CAM therapies do not share this information with their healthcare provider.
- Many do not feel comfortable revealing their CAM usage.
- Healthcare providers often do not inquire about CAM usage due to inadequate knowledge.

In a speech to faculty and students, the dean of Harvard Medical School, Joseph B. Martin, said that he had "come to believe that" it is through the establishment of a unique doctor-friend-patient relationship that most of the healing occurs, whether helped along by surgery, acupuncture, or regular doses of approved medicines.

**A Partnership of Responsibility**

Healthcare providers, as advocates and skilled professionals, have the capacity to assess and educate on a patient’s patterns of CAM usage that may have an adverse effect on their recovery from illness. Pharmacists play a key role in facilitating the dialogue between the patient and other members of the healthcare team, as well as coordinating pharmacological management. The pharmacist can also provide important information to the client on any dietary supplements that they are using, that the prescribing physician may not be aware of.
Here are some possible tools to begin assessing and educating on CAM:

- Add questions about CAM use in medical history forms, utilize the phrase “from acupuncture to zinc” to assist patients on what exactly CAM can encompass.
- Use specific assessment or consultation practices that gather data on CAM utilization. For example, using open-ended, nonjudgmental inquiry or statements such as:
  - “Tell me about other therapies you use to improve your health or quality of life. Some people use acupuncture, homeopathy, yoga, herbs ... We want your treatment plan to be as comprehensive and as safe as possible.”
  - “We can inform you if a nutritional supplement might interact with a prescription or over-the-counter medicine, or if the medicines might interfere with how your body absorbs, uses, or breaks down the nutritional supplement.”
- Provide handouts on various CAM therapies that are pertinent to the patient population served.
- Inform patients of known interactions between CAM and conventional medicine therapies.
- Encourage your patients to be proactive and share their CAM use with all their healthcare providers.

**Case Study: Circulation and Grape Seed Extract**

Mr. Patterson has insulin-dependent diabetes controlled with injection lispro. He suffers from moderate arthritis which causes him pain in his knees, shoulders, feet and hands. He is hypertensive and takes captopril. He admits to feeling worried about the circulation in his feet and that he is experiencing more tingling despite his well-controlled blood sugar levels over the last few months. He adds that he used to be a runner but his joint pain and worry over keeping his feet healthy (due to diabetes) keep him from exercising. He said that his daughter gave him an herbal supplement called grape seed extract to prevent diabetes complications and even help with his hypertension. He’s been taking two or three tablets per day of this supplement since then.

**Which of the following actions best supports Mr. Patterson’s goal of optimal health?**

- A. “Thank you for letting us know. I will add it to your health information record, let the doctor know, and check to see if there are any interactions with your current medications. What have you observed since taking the grape seed extract?”
- B. “I do not know about this supplement, but will check with the doctor to see if you should continue taking it. Please do not take any herbal supplements without first checking with us, okay?”
- C. “Okay. Is it working?”

The correct answer is B.
Case Study: Anxiety and CAM Therapies

Mary was diagnosed with breast cancer. She has intermittent pain which seems to be well-controlled by current levels of medication, but her overall quality of life is declining. She is complaining of a new onset of breathlessness and increased anxiety. She asks if there are any “natural” therapies she could use. She is willing to try anything to feel better.

Which complementary and alternative medicine therapies might alleviate some of her anxiety?

A. Guided Imagery, chamomile herbal therapy, and clary sage aromatherapy.
B. Meditation, feverfew herbal therapy, and peppermint aromatherapy.
C. Guided Imagery, fenugreek herbal therapy, and peppermint aromatherapy.

The correct answer is A.

CAM Integration

An apparent movement toward the integration of CAM therapies with the practice of conventional medicine is taking place. CAM practices and products frequently used adjunctively to mainstream medical care has produced significant improvements in CAM research methodology and data collection. Conventional health care, in turn, has used these improved research methods to examine some CAM practices, found similarities between their practices and CAM practices, and has begun including them in comprehensive care programs.

Conclusion

Hospitals are offering CAM therapies, health maintenance organizations (HMOs) are covering such therapies, a growing number of physicians use CAM therapies in their practices, insurance coverage for CAM therapies is increasing, and integrative medicine centers and clinics are being established, many with close ties to medical schools and teaching hospitals.

As the communication channels open between patients and their healthcare providers, opportunities will arise for further integration of an individual’s chosen CAM therapies and their conventional medical plan of care. In addition, improved education in medical schools and in patient care will further unfurl the opportunities to further develop the definition of health as more than the absence of disease.
References


National Center for Complementary and Integrative Health (NCCIH), National Institute of Health (2016, June). *Complementary, Alternative, or Integrative Health: What’s In a Name?* Retrieved from https://nccih.nih.gov/health/integrative-health


Disclaimer

This publication is intended solely for the educational use of healthcare professionals taking this course, for credit, from RN.com, in accordance with RN.com terms of use. It is designed to assist healthcare professionals, including nurses, in addressing many issues associated with healthcare. The guidance provided in this publication is general in nature, and is not designed to address any specific situation. As always, in assessing and responding to specific patient care situations, healthcare professionals must use their judgment, as well as follow the policies of their organization and any applicable law. This publication in no way absolves facilities of their responsibility for the appropriate orientation of healthcare professionals. Healthcare organizations using this publication as a part of their own orientation processes should review the contents of this publication to ensure accuracy and compliance before using this publication. Healthcare providers, hospitals and facilities that use this publication agree to defend and indemnify, and shall hold RN.com, including its parent(s), subsidiaries, affiliates, officers/directors, and employees from liability resulting from the use of this publication. The contents of this publication may not be reproduced without written permission from RN.com.

Participants are advised that the accredited status of RN.com does not imply endorsement by the provider or ANCC of any products/therapeutics mentioned in this course. The information in the course is for educational purposes only. There is no “off label” usage of drugs or products discussed in this course.

You may find that both generic and trade names are used in courses produced by RN.com. The use of trade names does not indicate any preference of one trade named agent or company over another. Trade names are provided to enhance recognition of agents described in the course.

Note: All dosages given are for adults unless otherwise stated. The information on medications contained in this course is not meant to be prescriptive or all-encompassing. You are encouraged to consult with physicians and pharmacists about all medication issues for your patients.