Alternative Therapies for Asthma

By

Judith Quaranta,
PhD, RN, CPN, AE-C, FNAP

Upon successful completion of this course, continuing education hours will be awarded as follows:
Nurses: 2 Contact Hours*

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Dr. Quaranta has received Individual Development Awards from Binghamton University, as well as a Transdisciplinary Area of Excellence Award to further her research in asthma. She has presented at multiple national conferences on the topic of asthma and self-management. Dr. Quaranta has also authored manuscripts for numerous journals including the Journal of School Nursing, Journal of Asthma and Allergy Educators, Online Journal of Rural Nursing, Journal of Family Social Work, and Journal of Interprofessional Care, as well authored chapters in textbooks on research and community and public health.

Judith Quaranta has disclosed that she has no significant financial or other conflicts of interest pertaining to this course book.

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Karen L. Meyerson has disclosed that she has no significant financial or other conflicts of interest pertaining to this course book.

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3) Complete the course evaluation

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COURSE EVALUATION
ALTERNATIVE THERAPIES FOR ASTHMA

INSTRUCTIONS: Using the scale below, please respond to the following evaluation statements. All responses should be recorded in the right-hand column of the FasTrax answer sheet, in the section marked “Evaluation.” Be sure to fill in each corresponding answer circle completely using blue or black ink. Leave any remaining answer circles blank.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Disagree</td>
</tr>
<tr>
<td>Strongly</td>
<td>Somewhat</td>
<td>Somewhat</td>
<td>Strongly</td>
</tr>
</tbody>
</table>

OBJECTIVES: After completing this course, I am able to:
1. State the prevalence of the use of alternative therapies to treat asthma.
2. Discuss the alternative therapies most commonly used by people with asthma and their roles in therapy.
3. Recognize potential benefits and risks associated with alternative therapies.
4. Discuss the financial impact of complementary and alternative therapies on the individual and the healthcare system.
5. Discuss the educational components the healthcare provider needs to provide for the person with asthma.

COURSE CONTENT
6. The course content was presented in a well-organized and clearly written manner.
7. The course content was presented in a fair, unbiased and balanced manner.
8. The course content presented current developments in the field.
9. The course was relevant to my professional practice or interests.
10. The final examination was at an appropriate level for the content of the course.
11. The course expanded my knowledge and enhanced my skills related to the subject matter.
12. I intend to apply the knowledge and skills I’ve learned to my practice.
   A. Yes  B. Unsure  C. No  D. Not Applicable

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The following section addresses your experience in interacting with Western Schools. Use the scale below to respond to the statements in this section.
   A. Yes  B. No  C. Not Applicable
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14. The Western Schools website was informative and easy to navigate.
15. The process of ordering was easy and efficient.
16. Western Schools staff was knowledgeable and helpful in addressing my questions or problems.

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17. I certify that I have read the course materials and personally completed the final examination based on the material presented. Mark “A” for Agree and “B” for Disagree.
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18. My overall rating for this course is
   A. Poor       B. Below Average   C. Average       D. Good         E. Excellent

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Note: To provide additional feedback regarding this course and Western Schools services, or to suggest new course topics, use the space provided on the Important Information form found on the back of the FasTrax instruction sheet included with your course.
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1. Begin this course by taking the pretest. Circle the answers to the questions on this page, or write the answers on a separate sheet of paper. Do not log answers to the pretest questions on the FasTrax test sheet included with the course.

2. Compare your answers with the answers in the PRETEST KEY located at the end of the pretest. The pretest key indicates the page where the content of that question is discussed. Make note of the questions you missed, so that you can focus on those areas as you complete the course.

3. Read the entire course and complete the exam questions at the end of the course. Answers to the exam questions should be logged on the FasTrax test sheet included with the course.

*Note:* Choose the one option that BEST answers each question.

1. The use of alternative therapies has
   a. been banned in some countries.
   b. increased in recent years.
   c. not changed in recent years.
   d. decreased in recent years.

2. Which does the U.S. Food and Drug Administration (2017b) recommend as a nonpharmacologic therapy for pain management for persons with asthma, as it may reduce the need for nonsteroidal anti-inflammatory drugs?
   a. Acupuncture
   b. Tian jiu therapy
   c. Homeopathy
   d. Ayurvedic

3. Studies have shown beneficial effects, but more research is needed for validation, of Tai chi, an ancient Chinese tradition that
   a. requires the human to be fully present, to be aware of where one is and what one is doing, and not to be overly reactive or overwhelmed by what is going on around oneself.
   b. employs kicking, striking, and defensive blocking with arms and legs.
   c. combines a series of movements performed in a slow, focused manner accompanied by deep breathing.
   d. is a group of physical, mental, and spiritual practices or disciplines.

4. Given the popularity and high cost of alternative therapies, it is acknowledged in the medical community that
   a. the public does not understand the effects of alternative therapies.
   b. eventually, the high cost will decrease the popularity of alternative therapies.
   c. despite their popularity, insurance companies will never cover the cost.
   d. well-designed clinical trials are needed to evaluate their effects.

*continued on next page*
5. A patient comes in for a follow-up appointment and asks for an alternative therapy to treat his asthma. The healthcare provider’s response to the patient regarding this therapy is to

a. research the product or modality and provide the individual advice.

b. provide the patient with the alternative therapy of choice.

c. ignore the patient’s request and continue his or her current asthma action plan.

d. provide the therapy at a low cost since insurance will not cover it.

PRETEST KEY

1. B page 1
2. A page 2-3
3. C page 5
4. D page 10
5. A page 11
INTRODUCTION

COURSE OBJECTIVES

After completing this course, the learner will be able to:

1. State the prevalence of the use of alternative therapies to treat asthma.
2. Discuss the alternative therapies most commonly used by people with asthma and their roles in therapy.
3. Recognize potential benefits and risks associated with alternative therapies.
4. Discuss the financial impact of complementary and alternative therapies on the individual and the healthcare system.
5. Discuss the educational components the healthcare provider needs to provide for the person with asthma.

LEARNING OUTCOMES

After completing this course, the learner will be able to discuss the implications of alternative therapies for asthma management.

OVERVIEW

A complementary, or alternative, therapy is any healing practice that is not considered part of conventional, mainstream medicine. Complementary therapies may be based on historical or cultural traditions, rather than on scientific evidence (National Asthma Council Australia, 2012). It is important to understand that there is a distinction between complementary and alternative practices. If a nonmainstream practice is used in conjunction with conventional medicine, it is considered complementary. If a nonmainstream practice is used in place of conventional medicine, it is considered alternative. Most people who use nonmainstream approaches combine them with conventional treatments (National Center for Complementary and Integrative Health, 2016).

Although not a mainstay of therapy, the use of alternative therapies by individuals with asthma warrants discussion because of its increasing popularity. The use of alternative therapies is so prevalent that healthcare professionals can expect to provide care to a large number of individuals who use these therapies. Alternative therapies may influence the delivery of medical care, so it is important to ask about a history of alternative therapy use in the assessment. Healthcare professionals have a responsibility to provide individuals who use other therapies with accurate information about the safety and potential adverse interactions with traditional medical care. It is imperative that the person with asthma understand the risks and benefits of alternative treatments, which ones have evidence-based effectiveness, and the need to maintain medical management and follow-up to ensure good asthma outcomes. This course focuses specifically on the use of alternative therapies in asthma treatment.
ALTERNATIVE THERAPIES FOR ASTHMA

PREVALENCE

The use of alternative therapies has increased in recent years. Some explanations for this increase include the following:

- A desire to reduce the amount of medicine needed
- A preference for the use of a “natural” alternative
- Disillusionment with Western medicine
- Having heard from others that a particular complementary therapy works well for their condition
- A sense that using complementary therapies gives individuals more control over treatment (National Asthma Council Australia, 2012)

Research shows that anywhere from 4% to 79% of individuals with asthma use alternative therapies (Ernst & Posadzki, 2012). Chen and colleagues (2013) found that the use of complementary and alternative treatments was related to one’s level of asthma control and that these treatments were used more frequently in those with uncontrolled asthma. According to Nahin, Barnes, and Stussman (2016), in the United States, one in every five individuals aged 4 years and older had expenditures for complementary and alternative therapies. A total of 55.2 million adults (23.5%) and 4.1 million children (7.1%) had at least one expenditure for some complementary health approach. Most of these were for the purchase of natural product supplements. See Figure 1 for common complementary approaches adults use.

ALTERNATIVE THERAPIES FOR ASTHMA

This course discusses several alternative therapies. Although these practices are currently being used, more research is needed to determine their safety and precise relationship with asthma. Some studies have shown positive findings for use with people with asthma, but most of these studies have major limitations, such as small sample sizes or questionable methodologies, or have not yet been replicated.

Acupuncture

Acupuncture is part of traditional Chinese medicine and involves the stimulation of specific points on the body by a variety of techniques, including insertion of thin metal needles through the skin (National Center for Complementary and Integrative Health, [NCCIH], 2013). According to the NCCIH (2013), there is little evidence that acupuncture is an effective treatment for asthma. Although some studies have shown some reduction in medication use and improvements in symptoms and quality of life, the majority
showed no difference between the effect of actual acupuncture and simulated or sham acupuncture on asthma symptoms. Sham treatment is analogous to a placebo, given to a control group during a trial, to objectively assess the effects of the actual treatment in a comparable group.

Traditional Chinese medicine uses acupuncture holistically in combination with diet, herbs, and lifestyle changes. Acupuncture is rarely used this way in the West, and the holistic approach is very difficult to study. The preponderance of evidence thus far does not document a clinical benefit of acupuncture in the treatment of asthma, but acupuncture has regulatory effects on mucosal and cellular immunity in individuals with asthma (Yang et al., 2016).

However, a more recent study demonstrated the potential effectiveness of acupuncture in the management of asthma in conjunction with traditional medical management of allergic asthma. Individuals with allergic asthma received up to 15 acupuncture sessions over 3 months and were compared with a control group receiving only routine care. The investigators looked at scores on the Asthma Quality of Life Questionnaire and a general health-related quality-of-life questionnaire at 3 and 6 months in 1,445 persons with asthma (Brinkhaus et al., 2017). Acupuncture was associated with improvement in asthma-related quality of life and in the physical and mental health aspects of the general health questionnaire (Short Form-36) at 3 and 6 months. In individuals with allergic asthma, acupuncture treatment in addition to routine care showed benefits (Brinkhaus et al., 2017).

It should be noted that the U.S. Food and Drug Administration (FDA, 2017b) recommends the use of acupuncture as a nonpharmacologic therapy for pain management. This is useful for

### FIGURE 1: 10 MOST COMMON COMPLEMENTARY HEALTH APPROACHES AMONG ADULTS, 2012

<table>
<thead>
<tr>
<th>Natural Products</th>
<th>17.70%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Breathing</td>
<td>10.90%</td>
</tr>
<tr>
<td>Yoga, Tai Chi,</td>
<td>10.10%</td>
</tr>
<tr>
<td>or Qi Gong</td>
<td></td>
</tr>
<tr>
<td>Chiropractic or</td>
<td>8.40%</td>
</tr>
<tr>
<td>Osteopathic Manipulation</td>
<td></td>
</tr>
<tr>
<td>Meditation</td>
<td>8.00%</td>
</tr>
<tr>
<td>Massage</td>
<td>6.90%</td>
</tr>
<tr>
<td>Special Diets</td>
<td>3.00%</td>
</tr>
<tr>
<td>Homeopathy</td>
<td>2.20%</td>
</tr>
<tr>
<td>Progressive Relaxation</td>
<td>2.10%</td>
</tr>
<tr>
<td>Guided Imagery</td>
<td>1.70%</td>
</tr>
</tbody>
</table>

persons with asthma, as it may reduce the need for nonsteroidal anti-inflammatory drugs, which can be problematic and exacerbate asthma symptoms. Additionally, the needles used for acupuncture are FDA approved and must meet the following requirements: (1) consist of a solid, stainless-steel needle; (2) be labeled for single use only; (3) be biocompatible; and (4) be sterile (Acupuncture Needle, 1996).

**Herbal Therapies**

Humans have used plants to treat illness for thousands of years. Herbal preparations are known to have pharmacologic effects. For this reason, many modern medications are derived from plants. Several drugs, including commonly used asthma medications, have their roots in herbal remedies. Examples of asthma medications with herbal roots include bronchodilators, mast cell stabilizers, antiallergics, ant-inflammatory agents, antispasmodic agents, and immunomodulatory drugs (Mali & Dhake, 2011).

Medicinal plants have been known for generations and are highly esteemed throughout the world as a rich source of therapeutic agents for disease and for ailment prevention. Chinese and Japanese medical systems use many herbs, often in fixed mixtures (e.g., ma huang and saibokuto), to treat asthma (Li, 2017). Although they are not widely used in the United States, many medicinal plants have been scientifically proven to be beneficial for treating asthma.

Studies have shown that certain herbs have anti-inflammatory properties that may be beneficial in asthma treatment. Components of these herbs that have these properties include polyphenols, triterpenoids, farnesol, and polysaccharides (Lin, Chiang, Ma, Lin, & Chen, 2015). Echinacea has been shown to have benefits for asthma by reversing the release of cytokines responsible for airway resistance: Šutovská and colleagues (2015) found bronchodilation and anti-inflammatory effects similar to those achieved with albuterol and budesonide. However, it must be noted that these studies involved animal subjects, not humans.

Zhu and colleagues (2014) investigated the effect of tian jiu therapy in Sanfu Days, which is a classic asthma treatment. These researchers had previously demonstrated that tian jiu therapy reduced the need for asthma medications and improved asthma control. This study looked at the optimal duration needed for this therapy, comparing outcomes at 1 and 2 years. Sanfu Days are the three hottest days in a year, calculated by an ancient Chinese calendar. The premise is that the “cold” status of the person with asthma is counteracted by the “hot,” which is said to prevent pathology. Tian jiu therapy involves applying herbal patches to specific acupoints, stimulating the formation of blisters, hyperemia, and suppuration, allowing removal of the pathogen from the body. Prevention of and reduction in respiratory tract infections, reduced airway inflammation, and reduced airway hyperresponsiveness have been attributed to this therapy (Zhu et al., 2014). The researchers found significant improvements in asthma control and bronchodilator use with 2 years of treatment. They also found that the effect of the treatment in year 1 persisted to year 2, indicating prolonged impact on the immune system. Extending the treatment to 2 years did not significantly affect the number of days of asthma-related symptoms compared with year 1 results. Importantly, no changes in pulmonary function were found in year 1 or year 2 (Zhu et al., 2014).

Chan, Lee, Lo, Wong, and Li (2015) conducted a meta-analysis literature review to determine the effectiveness of tian jiu, administered in the same way as described in the study by Zhu and colleagues (2014) during Sanfu Days. They found that people with asthma using this therapy had significant reductions in immunoglobulin E and eosinophils, showing a positive effect.
Studies have been conducted on the effectiveness of traditional Chinese medicine herbs (NCCIH, 2015d). Clinical trials show promising results. The herbal formula known as antiasthma herbal medicine intervention, compared with prednisone, demonstrated greater improvement in lung function and was found to be safe and well tolerated. People with asthma who took an extract of *Sophora flavescens* (a component of antiasthma herbal medicine intervention) reported positive clinical results and no side effects. Laboratory findings on traditional Chinese medicine herbal remedies suggest several possible mechanisms of action against asthma, including an anti-inflammatory effect, inhibition of smooth-muscle contraction in the airways, and modulation of immune system responses (NCCIH, 2015d).

Wu and colleagues (2014) examined the impact of combined traditional Chinese medicine therapy, which included an orally administered herbal medication, acupuncture, massage, herbal ointments, and weekly music therapy, on children with asthma. These therapies were given in addition to traditional asthma treatments. The researchers evaluated serum immunoglobulin E, emergency department visits and hospitalizations due to asthma, scores on the Asthma Control Test, and pulmonary function tests before and 3 months after therapy. Statistically significant results revealed a decrease in emergency department visits, hospitalizations, and immunoglobulin E levels. Asthma Control Test scores improved, as did peak flow readings. However, it does need to be pointed out that no control group was included in the study, so it is not possible to say that these improvements were solely due to the combined Chinese medicine therapy.

An example of an asthma herbal treatment that has been proven dangerous is ephedra, also called ma huang. Worldwide, ephedra is a commonly used herbal treatment for asthma because of its bronchodilator effect. Ephedra is a naturally occurring plant substance; its active ingredient is ephedrine. Ephedrine, when chemically synthesized, is regulated as a drug. Ephedra has many side effects and drug interactions, and it has been linked to at least 100 deaths. Ephedra raises blood pressure, stresses the cardiovascular system, and is linked to stroke and myocardial infarction. In 2004, the FDA banned the use of ephedra in the United States (University of Maryland Medical Center, 2016).

People with asthma should be cautious when using herbal therapies for their asthma management. Although herbal supplements are regulated by the FDA under the Dietary Supplement Health and Education Act of 1994, they are not regulated as food or drugs (FDA, 2017a). Manufacturers do not need FDA approval before selling their herbal product. The product can state health claims if the manufacturer has supporting research, but there must be a disclaimer that the FDA has not evaluated the claim. No specific medical claim can be attached to the product. The FDA does have to monitor the safety of these products once on the market and must take action against the manufacturer or distributor if a product is found to be unsafe. The FDA regulations that are in place ensure certain quality standards, but there is no guarantee that these products are safe for anyone to use (Mayo Clinic, 2017). Additionally, persons with asthma need to carefully read and follow the label instructions and recognize that “natural” does not always mean “safe.” Herbal supplements may contain dozens of compounds and may interact with prescribed asthma medications. It should be noted that most dietary supplements have not been tested in pregnant women, nursing mothers, or children (NCCIH, 2014).

Relaxation

The Global Initiative for Asthma (2017) recommends relaxation strategies for people with
asthma but cautions that there is insufficient evidence to support one stress reduction strategy over another. Goals and strategies should be identified to deal with emotional stress if this makes asthma worse. Emotions and stress are a strong trigger for asthma. In a healthy person, stress reduces airway resistance, and the airways dilate in response to the release of adrenaline. The opposite effects occur in a person with asthma. Likewise, exercise causes the airways to open in a healthy person, but it causes airway narrowing in a person with asthma. For individuals with asthma, difficulty breathing and increased respiratory symptoms may cause anxiety. It is thought that relaxation can help reduce the stress associated with acute asthma symptoms. Some data suggest that progressive muscle relaxation improves lung function in individuals with asthma, but it is generally acknowledged that relaxation alone does not produce clinically significant improvement in asthma (National Heart, Lung, and Blood Institute, 2007). Regardless, teaching individuals relaxation techniques (in addition to continuing other prescribed treatment) may improve asthma outcomes, if by nothing other than a placebo effect.

Tai chi, an ancient Chinese tradition, combines a series of movements performed in a slow, focused manner accompanied by deep breathing (Mayo Clinic, 2015). Sharma and Haider (2013) conducted a systematic literature review to determine whether tai chi is a beneficial treatment for persons with asthma. Their search revealed only five articles that met their criteria. Some of the positive findings included significant improvements in forced vital capacity, forced expiratory volume in 1 second (FEV1), peak flows, and asthma symptoms. Other studies demonstrated improved quality of life and exercise tolerance. Although the findings of these studies showed beneficial effects, more research is needed to further validate these findings.

Mindfulness is another technique that is gaining popularity. Mindfulness is defined as the basic human ability to be fully present, to be aware of where one is and what one is doing, and not to be overly reactive or overwhelmed by what is going on around oneself (Mindful, 2014). Pbert and colleagues (2012) evaluated the efficacy of an 8-week mindfulness training program for stress reduction in improving asthma-related quality of life and lung function in persons with mild, moderate, and severe persistent asthma. They found that at 12 months after the training, there were significant improvements in quality of life and perceived stress but not in lung function (FEV1 and peak flows).

**Homeopathy**

“There is little evidence to support homeopathy as an effective treatment for any specific condition” (NCCIH, 2015b, para. 4). One issue is that treatments are individualized, so comparison studies on effectiveness pose great challenges (NCCIH, 2015b). This alternative medical system was created in late-18th-century Germany. Homeopathy proposes two unconventional theories: (1) “Disease can be cured by a substance that produces similar symptoms in healthy people,” and (2) “the lower the dose of the medication, the greater its effectiveness” (NCCIH, 2015b, para. 3, emphasis in original). Homeopathic remedies are very diluted, so the belief is that they are not harmful, but many contain “substances that come from plants, minerals, or animals, such as red onion, arnica (mountain herb), crushed whole bees, white arsenic, poison ivy, belladonna (deadly nightshade), and stinging nettle” (NCCIH, 2015b, para. 4). The FDA regulates homeopathic remedies; however, the FDA does not evaluate the remedies for safety or effectiveness before they go on the market. As with herbal therapies, the
FDA monitors the safety of these products once on the market and must take action against the manufacturer or distributor if a product is found to be unsafe. FDA regulations are in place to ensure certain quality standards, but there is no guarantee that these products are safe for anyone to use (Mayo Clinic, 2017). Despite these risks, according to the 2012 National Health Interview Survey (as cited in NCCIH, 2015b), “an estimated 5 million adults and 1 million children used homeopathy in the previous year” (para. 5). “According to the 2007 National Health Interview Survey, out-of-pocket costs for adults were $2.9 billion for homeopathic medicines and $170 million for visits to homeopathic practitioners” (NCCIH, 2015b, para. 5). See Table 1 for homeopathic treatments specific to asthma.

**Ayurvedic Medicine**

Ayurvedic medicine (also called Ayurveda) is one of the world’s oldest medical systems; it originated in India more than 3,000 years ago. The practice includes the use of herbal compounds, massage, special diets, and cleansing techniques. Key concepts of Ayurvedic medicine include universal interconnectedness among people, their health, and the universe; the body’s constitution (prakriti), and life forces (dosha). Ayurvedic physicians prescribe individualized treatments, including compounds of herbs or proprietary ingredients, and provide diet, exercise, and lifestyle recommendations. In the United States, no states license Ayurvedic practitioners, but there are approved Ayurvedic schools. Many Ayurvedic practitioners are licensed in other fields, including midwifery and massage (NCCIH, 2015a).

The safety of this practice has not been established. Some of the herbs, minerals, and metals used in the treatments may be harmful, particularly if used improperly or without the supervision of a trained practitioner. Many of the materials used have not been studied for safety in controlled clinical trials. In the United States,

<table>
<thead>
<tr>
<th>TABLE 1: SELECT HOMEOPATHIC TREATMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
</tr>
<tr>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Blatta orientalis</td>
</tr>
<tr>
<td>Ipecacuanha</td>
</tr>
<tr>
<td>Lobelia inflata</td>
</tr>
<tr>
<td>Antimonium tartaricum</td>
</tr>
<tr>
<td>Sambucus nigra</td>
</tr>
<tr>
<td>Natrum sulphuricum</td>
</tr>
<tr>
<td>Tuberculunum</td>
</tr>
</tbody>
</table>

Ayurvedic products are regulated as dietary supplements; therefore, they are not required to meet the same safety and effectiveness standards as conventional medicines. Research has not established whether this modality is effective. Studies have shown that some Ayurvedic products contain lead, mercury, or arsenic (NCCIH, 2015a). See the section on herbal therapies for FDA regulations regarding these products.

Halpern (2016) presented a case study describing asthma treatment through Ayurvedic medicine, which illustrates how this practice is used for the person with asthma. Ayurvedic medicine views asthma as originating in the digestive system. A disruption in the basic life force causes an imbalance, which spreads from the digestive system to the lungs. Treatment then focuses on food intake to promote “warmth” in the gastrointestinal tract. Buttermilk, because it is fermented, is considered to provide this warmth. Also recommended are cumin, fennel, and ginger, which are considered hot spices. Fear, worry, and anxiety associated with asthma are treated with foods to pacify these emotions. These may include tonic herbs, including shatavari, licorice, bala, and ashwagandha. An Ayurvedic herbal laxative, triphala, is also given as well as Hingwastika, an Ayurvedic formula to stimulate digestion. Additionally, breathing exercises called pranayama are used to control breathing as well as stimulate digestion. Eating habits are also addressed: Meals should be consumed in a quiet environment with food chewed slowly and thoroughly.

**Breathing Exercises and Yoga**

Breathing exercises have not proved, by themselves, to influence asthma outcomes. Macêdo, Freitas, Chaves, Holloway, and Mendonça (2016) evaluated breathing exercises in children through a systematic review of research up to 2015. They concluded that the results, although showing asthma improvement, could not be attributed solely to the breathing exercises because they were part of comprehensive asthma care. Similar findings were found for adults. Freitas and colleagues (2013) conducted a systematic review of the research up to the year 2013. They found that even though individual trials reported positive effects of breathing exercises, no reliable conclusions could be drawn due to methodological differences. However, trends for improvement were noted.

Research has also not demonstrated that yoga improves asthma outcomes. In a systematic review and meta-analysis of 14 randomized controlled trials with 824 persons with asthma, Cramer, Posadzki, Dobos, and Langhorst (2014) concluded that yoga cannot be considered a routine intervention for asthma. Although positive effects of yoga compared with usual care were found for asthma control, quality of life, asthma symptoms, peak flows, and FEV₁/forced vital capacity ratio, no differences were found when comparing these outcomes with those of sham treatment.

A Cochrane systematic review by Yang and colleagues (2016) looked at 15 randomized controlled studies with 1,048 persons with asthma. Although the researchers found that practicing yoga may lead to improvements in quality of life and asthma symptoms to some extent, the impact on lung function was unclear. Further studies are needed to provide more conclusive evidence.

**Nutrition**

Weight reduction in adults should be encouraged, and lifestyle changes should be encouraged for children. An insufficient intake of vitamins A, C, and D is associated with a higher risk for asthma, so sources of these vitamins should be included in the diet (Pfab et al., 2013). Research has also studied the effects of diet on asthma, as well as certain minerals and elements, as described in the following sections.
**Diet**

Consuming a Mediterranean diet during childhood may be a protective factor for asthma. This diet, which involves a high consumption of nuts, has been associated with a 50% reduction in wheezing (Misra, 2016). However, because there is a high correlation between asthma and allergies (especially in children), high consumption of nuts should be viewed with caution. Consumption of margarine, which is not associated with this diet, doubled the risk for wheezing, whereas olive oil, a staple of the Mediterranean diet, did not show similar findings. A high consumption of vegetables is also associated with less wheezing. Higher intake of beverages sweetened with high-fructose corn syrup has been shown to increase the risk for wheezing and asthma (Misra, 2016). See Figure 2 for information about the Mediterranean diet.

**Selenium**

Researchers have investigated the benefit of selenium for individuals with asthma. Selenium is a trace element that has antioxidant properties that counteract the damaging effect of oxidative stress and maintain the health of the airways. Selenium helps prevent cellular damage by assisting with the conversion of free radicals (Bishopp et al., 2017; National Institutes of Health, Office of Dietary Supplements, 2016). Although some small studies have shown positive findings with selenium and asthma, these results have not been replicated. Bishopp and colleagues (2017) looked at the effect of selenium, in addition to other vitamins and trace elements, in people with increasing asthma severity. The researchers found no significant difference in selenium levels between people with mild or severe asthma and the healthy control group. They concluded that the association between antioxidant levels and asthma is not as straightforward as a simple dose response due to oxidative stress and may be attributable to factors that affect use and function rather than absolute deficiency.

**Magnesium**

Magnesium has long been a focus of dietary supplements for individuals with asthma because serum levels of magnesium are known to be low in these individuals and may decrease further through the use of β2-agonists. Magnesium is commonly found in nuts, legumes, grains, brown rice, seafood, and several vegetables. Research the NCCIH (2015c) supported provides evidence that adults with mild to moderate asthma may benefit from taking magnesium supplements. People with asthma who took magnesium supplements for 6.5 months demonstrated significant improvement in asthma control and quality of life but no changes in FEV1 or levels of C-reactive protein (a marker of inflammation) compared with those who did not take a magnesium supplement.

**Omega-3 Fatty Acids**

Fatty acids play an essential role in the formation of the inflammatory mediators involved in asthma. Intake of omega-3 fatty acids, as well as omega-6 fatty acids, is essential for cell membrane incorporation. Omega-3 fatty acids have been thought to reduce the incidence of asthma, whereas omega-6 intake is associated with increasing asthma prevalence. Therefore, changes in diet could modify the production of the inflammatory mediators derived from these compounds. It has been hypothesized that decreasing the omega-6/omega-3 ratio could reduce the production of proinflammatory mediators while increasing the formation of metabolites that can limit or resolve inflammation. However, research findings do not bear this out. Intake of omega-3 fatty acids did not improve asthma outcomes. Although some studies might have demonstrated benefits, these studies have not been replicated. It is thought
that certain asthma phenotypes may have better outcomes with omega-3 supplementation or dietary changes. More research is needed (Wendell, Baffi, & Holguin, 2014).

Writing

Expressive therapeutic writing has been used with people with chronic conditions to reduce the impact of the disease as well as to reduce healthcare costs. This therapy can take several forms and has changed over time due to advances in technology (e.g., Internet blogging). It can be facilitated or nonfacilitated. The writing can be developmental and follow oneself over time, or it can be creative. Expressive writing involves the disclosure of traumatic experiences, which is thought to facilitate cognitive and emotional processing, helping reduce the physiological stress associated with inhibiting emotions (Nyssen et al., 2016; Smith et al., 2015).

Smith and colleagues (2015) assessed whether expressive writing can improve lung function, quality of life, and medication use in people with asthma. Participants completed either expressive writing or unemotional writing for 20 min on 3 consecutive days. Lung function (FEV\textsubscript{1} percentage predicted), quality of life, asthma symptoms, and medication use were recorded at baseline and at 1, 3, 6, and 12 months. The researchers found that expressive writing improved lung function by 14% for 12 months for participants with less than

80% FEV\textsubscript{1} percentage predicted at baseline. No improvement was observed in the control group (Smith et al., 2015). In contrast to these findings, however, a meta-analysis Nyssen and colleagues (2016) conducted found no beneficial impact of therapeutic writing on asthma outcomes as measured by FEV\textsubscript{1}, asthma symptoms, and mood.

**Other Alternative Therapies**

Chiropractic medicine focuses on the relationship between the body’s main structures – the skeleton, the muscles, and the nerves – and health. Chiropractors believe that health can be improved and preserved by making adjustments to these structures, particularly to the spinal column. Medications are not part of chiropractic care. This field has gained acceptance in recent years, and most services are covered by insurance. Chiropractors are bound by the same regulations and ethics as medical doctors (Association of Chiropractic Colleges, n.d.). Several systematic reviews have been completed, and all have found positive outcomes for people with asthma (Alcantara, Alcantara, & Alcantara, 2012; Gleberzon, Arts, Mei, & McManus, 2012; Pepino et al., 2013). However, all of these reviews highlighted the small sample size and lack of randomized controls. More studies with greater rigor need to be conducted to demonstrate the effectiveness of this modality for asthma. Like acupuncture, chiropractic care is recommended by the FDA (2017b) for the nonpharmalogic treatment of pain, reducing the potential use of nonsteroidal anti-inflammatory drugs, which can exacerbate asthma.

Osteopathic medicine utilizes all aspects of modern medicine, “including prescription drugs, surgery, and the use of technology to diagnose disease and evaluate injury” (American Association of Colleges of Osteopathic Medicine, n.d., para. 1). Additionally, this modality uses a treatment called osteopathic manipulative medicine. Doctors of osteopathy use their hands to diagnose illness and injury and encourage the body’s natural tendency toward self-healing. “Osteopathic medicine emphasizes helping each person achieve a high level of wellness by focusing on health promotion and disease prevention” (American Association of Colleges of Osteopathic Medicine, n.d., para. 1). A systematic review of pediatric asthma and osteopathy showed varying results. Seven randomized controlled trials suggested that manipulation led to a significantly greater reduction in asthma symptoms, but another seven indicated no effect on asthma (Posadzki, Lee, & Ernst, 2013). More research is needed.

**COST OF ALTERNATIVE THERAPIES**

More than $30 billion is spent yearly on alternative therapies, accounting for $28.3 billion for adults and $1.9 billion for children 4 years and older (Nahin et al., 2016). Almost half of these expenditures ($14.7 billion) were for complementary practitioners. Natural product supplements ($12.8 billion) and self-care approaches ($2.7 billion) accounted for the remaining dollars. The mean annual out-of-pocket expense was $510 (Nahin et al., 2016). The out-of-pocket amount paid for natural product supplements was approximately 24% of the out-of-pocket costs for prescription medications and almost 30% of the amount paid for conventional physician services (Nahin et al., 2016).

Individuals’ searches for alternative therapies may represent a lack of satisfaction with traditional medicine and frustration with the chronicity of asthma symptoms. Given the popularity and high cost of alternative therapies, it is acknowledged in the medical community that well-designed clinical trials are needed to evaluate their effects.
THE HEALTHCARE PROFESSIONAL’S ROLE IN PROVIDING EDUCATION

Healthcare professionals should ask individuals and families about the use of alternative therapies as a routine part of the assessment. Failure to do so results in inadequate information gathering and missed educational opportunities. The healthcare professional should create a climate of trust to encourage the sharing of information.

The person with asthma needs to be educated about the risks and benefits of both conventional asthma treatments and alternative therapies. Due to a lack of scientific evidence that alternative treatments are as effective as conventional medicine, the person with asthma needs to be encouraged not to postpone medical treatment in favor of an alternative approach. The healthcare professional should provide information about how to research these alternative therapies to determine their safety. It also needs to be emphasized that interactions can occur between herbal remedies and other practices, which might be harmful and lead to adverse asthma outcomes (NCCIH, 2013).

It is impossible to be informed about all alternative therapies, but healthcare professionals should be aware of commonly used therapies, especially those used by the populations they serve. The healthcare provider should be honest with a client if he or she is not familiar with a particular therapy. However, healthcare providers should follow up this situation by researching the product or modality and providing the individual advice.

Healthcare professionals have an obligation to provide individuals and families scientifically sound information on the use of alternative therapies. Websites that are reputable should be viewed by both the healthcare professional and the person with asthma considering the use of alternative and complementary therapies. Cruse (2012) reviewed online resources for quality; the following websites are reliable sources of information:

- Natural Medicines Comprehensive Database: http://naturaldatabase.therapeuticresearch.com
- Natural Standard: http://www.naturalstandard.com/
- DynaMed Plus: http://dynamed.ebscohost.com/
- National Heart, Lung, and Blood Institute: http://www.nhlbi.nih.gov/
- National Jewish Health: https://www.nationaljewish.org/home
- NCCIH: https://nccih.nih.gov/
- WholeHealthMD: http://www.wholehealthmd.com

CASE STUDY 1

Tia, a 26-year-old graduate student, is in to see you today for annual follow-up of her persistent asthma. She is a vegetarian and favors what she calls a “natural” approach to her asthma therapy. It has been 6 months since she was last seen in your asthma clinic, and she reports having to use her albuterol inhaler at least four to six times a week. The reason she has come in today is that her primary care provider will no longer refill her albuterol without her first seeing you. Tia says she is not using her prescribed combination therapy medication as daily control therapy. She tells you that she has researched alternative therapies and is considering starting acupuncture.
Questions
1. What is the first question you would ask her?
2. What could you tell her about the use of acupuncture as an alternative or complementary modality in asthma treatment?
3. Would any certain diet help her asthma?

Responses
1. The first question to ask is why she is not using her combination therapy, which can also identify barriers and any concerns or unfounded fears she may have. Successful asthma outcomes are dependent on the shared goals and collaborative efforts of a provider–patient partnership. This is also a good opportunity to acknowledge and support her desire to control her asthma. The discussion should include the need to combine conventional medicine/health care with alternative and complementary therapies. It is important to point out that most of the studies that demonstrated good outcomes with asthma used alternative therapies in conjunction with traditional, conventional health care. It is also important to note that at this point, Tia’s asthma is not under control; therefore, her attempt to manage her asthma with alternative and complementary therapies will not likely be effective.

2. Acupuncture is an ancient Chinese therapy that involves inserting thin metal needles into specific areas of the body. Tia should know that, according to the NCCIH (2013), there is little evidence that acupuncture is an effective treatment for asthma. Although some studies have shown some reduction in medication use and improvements in symptoms and quality of life, the majority showed no difference between actual acupuncture and simulated or sham acupuncture on asthma symptoms. It is also imperative to find out why Tia wants to use alternative or complementary therapies; questions such as the following should be asked: (1) Is it a desire to reduce the amount of medicine needed? (2) Is it a preference to use a “natural” alternative? (3) Is she disillusioned with Western medicine? (4) Has she heard from others that a particular complementary therapy works well for her condition? Sometimes open-ended questions, such as “Tell me what you have heard about inhaled corticosteroids,” will help elicit fears and concerns that may increase behaviors of seeking alternative treatments.

3. There is some evidence that the Mediterranean diet might be beneficial for asthma. Encourage Tia to consider this diet because the foods included are known to improve overall health in general through avoidance of polyunsaturated fats and high-fructose corn syrup.

CASE STUDY 2
A 36-year-old woman with asthma is having difficulty with asthma control. She has been researching alternative and complementary therapies but states that she feels confused. She has read about homeopathy, osteopathy, and Ayurvedic medicine. She asks you which you think would be best for her. She wonders if many people use these therapies and how this affects costs to the healthcare system.

Questions
1. What information would you give her about homeopathy, osteopathy, and Ayurvedic medicine?
2. What discussion should you have regarding her level of asthma control?
3. What would you tell her about how complementary therapies affect healthcare system costs?
Responses

1. It is important to emphasize to your client that although homeopathy and Ayurvedic medicine claim to be beneficial in the treatment of asthma, there is no regulation of products used in these practices before going on to the market for purchase. The FDA does not evaluate these treatments for safety or effectiveness beforehand. She needs to be wary of possible interactions with her prescribed medications to prevent any potential adverse outcomes. Additionally, if these treatments are not effective, her asthma will probably worsen, and exacerbations may occur that can lead to emergency room visits and/or hospitalizations. Osteopathic medicine uses all aspects of modern medicine, with a focus on health promotion and disease prevention. Osteopathy is regulated, and practitioners are licensed to ensure a minimal level of competency as well as practice standards. Research is still inconclusive as to the overall impact of these modalities on asthma outcomes. However, as osteopathy meets specific standards and criteria, this practice would be the first preference for this client.

2. As the healthcare professional, you need to assess her asthma management skills and knowledge. You need to ensure that she knows how to use her inhaler correctly, that she practices trigger avoidance, and that she is aware of her early warning signs. This would be a good opportunity to discuss an asthma action plan, with updating as needed. You also need to encourage her not to abandon traditional medicine because there is no definitive research that these other modalities help the person with asthma.

3. Costs for alternative and complementary practices are high. More than $30 billion is spent yearly on alternative therapies, accounting for $28.3 billion for adults and $1.9 billion for children 4 years and older (Nahin et al., 2016). Almost half of these expenditures ($14.7 billion) were used for complementary practitioners. Natural product supplements ($12.8 billion) and self-care approaches ($2.7 billion) accounted for the remaining dollars (Nahin et al., 2016). The mean annual out-of-pocket expense was $510. The out-of-pocket amount paid for natural product supplements was approximately 24% of the out-of-pocket costs for prescription medications and almost 30% of the amount paid for conventional physician services (Nahin et al., 2016). As these statistics demonstrate, many individuals with asthma are seeking alternative or complementary therapies. It is helpful and advised to assess for use of these therapies and to discuss with clients the risks and benefits of these therapies.

SUMMARY

The use of alternative therapies by individuals with asthma is increasing but is often underreported to healthcare providers. Some therapies, especially herbals with bioactive ingredients, may be harmful; consumer safety information on such products is generally lacking. More healthcare providers need to be prepared to incorporate both conventional and nontraditional medical therapies in the care and management of individuals with asthma. The most important of all principles to remember when considering alternative therapies is that alternative medications are not substitutes for recommended asthma management strategies.
1. Which of the following statements best describes the prevalence of alternative therapies among persons with asthma?
   a. Prevalence use ranges from 4% to 79%.
   b. Prevalence use is greater in those whose asthma is under control.
   c. Prevalence use decreases as one gains a sense of control over his or her asthma.
   d. Prevalence use is higher in those persons with asthma who have confidence in Western medicine.

2. Research has found that complementary and alternative treatments were used more frequently in those with
   a. no medical insurance.
   b. controlled asthma.
   c. frequent side effects from traditional medications.
   d. uncontrolled asthma.

3. Tian jiu therapy in Sanfu Days involves
   a. drinking a potion made with specific herbs on the three hottest days of the year.
   b. eating cakes made of medicinal herbs on the three coldest days of the year.
   c. wearing patches of specific medicinal herbs on the three hottest days of the year.
   d. administering an intravenous infusion of specific Chinese herbs on the hottest day of the year.

4. A common herbal remedy that is used worldwide for asthma yet has been banned in the United States due to its potential danger and linkage to deaths is
   a. ephedra.
   b. cromone.
   c. Echinacea.
   d. ginseng.

5. Healthcare providers should inform a patient who is considering herbal supplements that
   a. if the product states it is natural, it is then safe to use.
   b. the U.S. Food and Drug Administration has evaluated all health claims by the manufacture.
   c. medically, it is safe to use any herbal supplement on the market.
   d. there is no guarantee that these products are safe for anyone to use.

6. Which diet adhered to during childhood may be a protective factor for asthma and has been associated with a 50% reduction in wheezing?
   a. Mediterranean
   b. Paleo
   c. Vegan
   d. Ketogenic
7. Which of the following is true regarding the costs of complementary and alternative treatments?
   a. Costs are covered by insurance, with little to no out-of-pocket expense for the person with asthma.
   b. More is spent on treatments for children than those for adults.
   c. More is spent on complementary practitioners than on natural product supplements.
   d. Out-of-pocket expenses are greater for homeopathic practitioners than for homeopathic medicines.

8. A potential reason cited for people willing to pay the higher cost for alternative therapies is that the individual
   a. has less adverse reactions with the alternative therapies.
   b. is frustrated with the chronicity of asthma symptoms.
   c. feels the alternative therapies are more effective.
   d. has easier access to the alternative therapies.

9. The person with asthma needs to be encouraged not to postpone medical treatment in favor of an alternative approach because
   a. conventional medicine is always the best therapy that is available.
   b. of the lack of scientific evidence that alternative treatments are as effective as conventional medicine.
   c. insurance will not cover most of the current alternative therapies.
   d. conventional medicine is more cost effective than an alternative approach.

10. When providing education to the person with asthma, the healthcare provider
    a. does not need to assess the use of complementary and alternative treatments because it is not part of the asthma action plan.
    b. does not need to provide education on complementary and alternatives therapies because they have no impact on asthma outcomes.
    c. should tell the person with asthma to only use state-licensed homeopathic practitioners.
    d. should provide evidence-based information from reputable websites.

This concludes the final examination.
Please answer the evaluation questions found on page v of this course book.
REFERENCES


References—
Alternative Therapies for Asthma


