DANA BARTLETT, RN, BSN, MA, MSN

Dana Bartlett is a professional nurse and author. His clinical experience includes 16 years of ICU and ER experience and over 20 years of as a poison control center information specialist. Dana has published numerous CE and journal articles, written NCLEX material, written textbook chapters, and done editing and reviewing for publishers such as Elsevire, Lippincott, and Thieme. He has written widely on the subject of toxicology and was recently named a contributing editor, toxicology section, for Critical Care Nurse journal. He is currently employed at the Connecticut Poison Control Center and is actively involved in lecturing and mentoring nurses, emergency medical residents and pharmacy students.

ABSTRACT

Acupuncture has been identified to be a useful therapy for many conditions. It has become widely accepted as a complementary and integrated treatment. Yet, there remain several basic questions in the research and amongst clinicians related to how acupuncture works and whether individuals are reporting a placebo effect. Acupuncture has been around for many years with a rise in its integration into conventional Western medicine. Ongoing research is needed to identify the efficacy of acupuncture for certain conditions in addition to those summarized in this study.
Continuing Nursing Education Course Director & Planners
William A. Cook, PhD, Director; Doug Lawrence, MS, Webmaster;
Susan DePasquale, CGRN, MSN, FPMHNP-BC, Lead Nurse Planner

Accreditation Statement
This activity has been planned and implemented in accordance with the policies of NurseCe4Less.com and the continuing nursing education requirements of the American Nurses Credentialing Center's Commission on Accreditation for registered nurses.

Credit Designation
This educational activity is credited for 3 hours. Nurses may only claim credit commensurate with the credit awarded for completion of this course activity.

Course Author & Planner Disclosure Policy Statements
It is the policy of NurseCe4Less.com to ensure objectivity, transparency, and best practice in clinical education for all continuing nursing education (CNE) activities. All authors and course planners participating in the planning or implementation of a CNE activity are expected to disclose to course participants any relevant conflict of interest that may arise.

Statement of Need
Acupuncture is used to treat a variety of conditions. Health teams need to be familiar with the growing body of research and the conditions that acupuncture is known to more effectively treat.

Course Purpose
To provide nurses and health associates knowledge about acupuncture as a form of complementary and integrated healthcare.
Learning Objectives

1. Identify the theory by which acupuncture is thought to work.
2. Identify one mechanism of action by which acupuncture is thought to work.
3. Identify three specific conditions for which there is evidence that acupuncture can be helpful.
4. Identify two conditions that may be contraindications for the use of acupuncture.
5. Identify two common side effects of acupuncture.

Target Audience

Advanced Practice Registered Nurses, Registered Nurses, Licensed Practical Nurses, and Associates

Course Author & Director Disclosures

Dana Bartlett, RN, MA, MSN, William S. Cook, PhD,
Douglas Lawrence, MS, Susan DePasquale, CGRN, MSN, FPMHNP-BC - all have no disclosures

Acknowledgement of Commercial Support:

There is no commercial support for this course.

Activity Review Information:

Reviewed by Susan DePasquale, CGRN, MSN, FPMHNP-BC.

Release Date: 6/26/2014  Termination Date: 6/26/2017

Please take time to complete the self-assessment Knowledge Questions before reading the article. Opportunity to complete a self-assessment of knowledge learned will be provided at the end of the course.
1. Acupuncture is thought to work by:
   a. The manipulation of the life force Qi
   b. Affecting the circulation to vital organs
   c. Altering magnetic currents
   d. Increasing the activity of meridians

2. Acupuncture is performed by inserting needles into specific areas called:
   a. Meridians
   b. Acupoints
   c. Pressure points
   d. Azimuths

3. Which of these has been identified as a mechanism of action of acupuncture?
   a. Changes in microcirculation
   b. Increasing oxygen carrying capacity
   c. Influencing the patient by the placebo effect
   d. Decreasing the release of endogenous opioids

4. There is some reasonable evidence for using acupuncture to treat:
   a. Headache
   b. Hematomas
   c. COPD
   d. Reflux
5. There is some reasonable evidence for using acupuncture to treat:
   a. Angina
   b. Bronchitis
   c. Low back pain
   d. Thyroid disorders

6. There is some reasonable evidence for using acupuncture to treat:
   a. Gallstones
   b. Dysphagia
   c. Deep vein thrombosis
   d. Nausea and vomiting

7. The **most common adverse event caused by acupuncture is:**
   a. Pneumothorax
   b. Infection
   c. Thromboembolism
   d. Hematoma

8. Common side effects of acupuncture include:
   a. Nausea
   b. Blurred vision
   c. Chest pain
   d. Cough
9. **Common side effects of acupuncture include:**
   a. DVT
   b. Constipation
   c. Dizziness
   d. Hyperglycemia

10. **Which of these is a contraindication for acupuncture?**
    a. Lung disease
    b. Bleeding disorders
    c. Heart disease
    d. Gallbladder disease.
INTRODUCTION

Acupuncture is an ancient technique of medicine and healing that been used in Asia for centuries. It was virtually unknown in the United States until the 1970s and even today many people consider it somewhat exotic and mysterious. However, acupuncture also appears to be gaining acceptance by the American public. The latest information available, from 2008, noted that approximately 3.1 million adults in the United States had been treated with acupuncture in the previous year.\(^1\) The National Institutes of Health (An agency of the US Department of Health responsible for biomedical research) published a consensus paper in 1997 on acupuncture, which stated:

“... promising results have emerged, for example, showing efficacy of acupuncture in adult postoperative and chemotherapy nausea and vomiting and in postoperative dental pain. There are other situations ... in which acupuncture may be useful as an adjunct treatment or an acceptable alternative or be included in a comprehensive management program. Further research is likely to uncover additional areas where acupuncture interventions will be useful.”\(^2\)

The British Medical Association also recognizes acupuncture as a reasonable treatment for many conditions. However, despite this growing popularity and the seeming movement of acupuncture into the mainstream of care, there is still considerable skepticism in the conventional medical community about the effectiveness of, and the scientific basis for acupuncture. The same National Institutes of Health consensus statement cited above also found that many of the studies that have investigated how well specific clinical conditions respond to acupuncture had methodological problems limiting their usefulness.
There have been numerous studies that have indicated that sham acupuncture or placebo are as good as traditional acupuncture, and many people have concluded that the theoretical foundation of acupuncture has no basis in fact. 3,4

Ever since acupuncture has become well known and widely used in the Western world, two questions have been asked: how does acupuncture work, and does it really work? These questions have not been definitively answered despite years of research. There are many people that believe in acupuncture and depend on it, and there are many people who state that there is no proven benefit of acupuncture, that any improvements in a patient’s condition are imagined, and, that it is no better than traditional medical treatments or placebos. Nonetheless, acupuncture is likely to become increasingly popular and nurses will need to understand this ancient medical technique.

HISTORY OF ACUPUNCTURE

Acupuncture has been practiced in Asia for thousands of years. The first written mention of acupuncture dates to 600 BC, and a comprehensive book on acupuncture, Zhen Jiu Jia I Jin, was written in the third century AD. 5 However, there is evidence that acupuncture may have been practiced long before those times, and if acupuncture itself was not practiced, it appears there was some knowledge of and speculation about the system of meridians. 6

During the Ming Dynasty (1368-1644) The Great Compendium of Acupuncture and Moxibustion was published which described the full set of 361 acupoints that are still taught and accepted today. However, the use and acceptance of acupuncture slowly fell into decline and in
1929 it was outlawed in China. After China’s communist party gained power in 1949, this law was repealed and acupuncture, along with other forms of traditional medicine, was once again widely practiced.

Although Western society had learned of acupuncture a long time ago and it was practiced in France in the early 1800s, it was not until a New York Times editor, James Reston, fell ill while visiting China that acupuncture became widely known in the West. It is reported that Reston needed emergency surgery for appendicitis, and that, in initial reports, traditional anesthesia was not used during the operation - acupuncture alone was sufficient to keep him comfortable and pain free. However, it was later learned that these reports were false and that acupuncture was used to treat his post-operative pain, not as a substitute for anesthesia. Regardless, many Americans now knew what acupuncture was and today acupuncture is practiced worldwide.

**THEORY AND PRACTICE OF ACUPUNCTURE**

The practitioners of acupuncture believe that two opposing forces, yin and yang, rule the human body. These forces must be in balance and in harmony. If they are not, illness results because of the movement of Qi through the body is disrupted. This concept is the basis of acupuncture.

Qi (pronounced chee) is described as a life force that flows through channels in the body that are called *meridians*, and pain, disease, and illnesses occur when there is an imbalance or disruption in the flow, strength, and quality of Qi through the meridians. The acupuncturist corrects this disruption in the flow of Qi by inserting very fine needles - 0.15 to 0.30 mm in diameter – into the skin at certain distinct
locations called **acupoints**. Acupoints are places on the body where the meridians carrying Qi pass close to the surface of the skin. It is hoped that the needle insertion alters the flow of Qi, heals the patient, and promotes health.

There are different styles of acupuncture, and the treatment procedure will differ depending on the particular practitioner. However, quite often an acupuncture session will be conducted in a way that will be familiar to anyone who has visited a physician who practices Western style medicine. The session begins with an interview. The patient describes his/her signs and symptoms, tells the acupuncturist about past medical history, medications he/she is taking, and family medical history. The acupuncturist will perform a standard physical examination, but will also take special notice of the patient’s tongue, ears, and pulses.

During the physical examination, the tongue will be examined for its color, surface irregularities, and the type and consistency of the coating on the tongue. It is felt that as the tongue is highly vascular and has a rich nerve supply, and an examination of the tongue can provide diagnostic clues about health and wellness. The condition of the radial pulse is thought to reflect the flow of Qi. The acupuncturist will also use familiar techniques of Western medicine such as palpation and auscultation during the examination.

Inspection of the patient by the acupuncturist and the interview are considered very important parts of the initial exam. No blood samples are drawn and no radiographic exams are used: an interview and a
physical exam alone are the only diagnostic tools used by acupuncturists.

Once the acupuncturist has determined the nature of the problem, the patient is placed in a comfortable position (usually, lying down and facing up) and the sterile, one-time use needles are inserted. The depth of needle insertion can vary from 0.5 cm to 8 cm; the great majority of needle insertions are very shallow. As mentioned previously, the needles are very fine, much thinner than the smallest needles used for intradermal injections. The needles may be manipulated by hand (in or out, rotated, continuously or intermittently), stimulated by electricity, heated with a burning herb, or simply left in place. The needles are typically left in place for 5 to 20 minutes. This is what is usually called the traditional form of acupuncture but there are other therapies that are often considered to be acupuncture and called acupuncture, such as, auricular acupuncture (needling only the ear), acupressure, which is application of pressure to acupoints, abdominal acupuncture, and scalp acupuncture.

The number and frequency of the visits to an acupuncturist varies depending on the nature of the underlying problem and the response to treatment. The goal of the acupuncturist is to restore the flow of Qi to the area that is out of balance. The location of the needles depends on the meridian that is considered the one to be affected. The patient may be advised to avoid strenuous activity, alcohol, large meals, and sexual activity for eight hours after a treatment. One treatment is not thought to be sufficient; four to ten is generally considered to be a reasonable number of treatments to determine if the patient’s problem can be helped with acupuncture.
In the United States acupuncture can be performed by a licensed acupuncturist who has receive up to 4,000 hours of training or by physicians, dentists, or chiropractors who have taken training courses in acupuncture. The rules, requirements, and restrictions on the practice of acupuncture vary from state to state. Some health insurance plans will cover the cost of acupuncture treatments.

**EXAMINING EVIDENCE AND THEORIES**

The two important questions surrounding acupuncture are *how* does it work, and *does* it work. What are the mechanisms of action of acupuncture and is it truly an effective therapy that provides a clinical benefit? Before reviewing the evidence for the proposed mechanisms of action of acupuncture and its effectiveness, the theory that explains acupuncture as a system of medicine should be examined.

**How does acupuncture work?**

Acupuncture practitioners believe that acupuncture works by correcting the flow of Qi. This correction of the flow of Qi is done by inserting needles into acupoints that are located on the Qi channels, the meridians, and specific acupoints are thought to correspond to specific areas of the body and organ systems.

The presence of the life force Qi has never been documented or confirmed. Despite numerous studies there is no anatomical or histological evidence of acupoints or meridians,\(^7\text{-}^\text{10}\) and studies by practitioners of acupuncture have stated that the presence of acupoints has *preliminarily* been confirmed, but there is no proof of their specificity.\(^\text{11}\) The 1997 National Institute of Health consensus
statement on acupuncture that supported its use also noted that “Despite considerable efforts to understand the anatomy and physiology of the acupuncture points, the anatomy and physiology of these points remains controversial.”

However, although there is no evidence for the existence of Qi, acupoints, or meridians, there is a considerable amount of evidence from animal and human studies showing that acupuncture does produce biologic responses. Why these occur, if they are indeed caused by acupuncture and whether or not they represent the mechanism, or mechanisms of actions by which acupuncture may be effective, is not known.

There are many theories that have attempted to explain how acupuncture works but at this point none has been conclusively proved. Some of the more common ones are discussed below.

*Endogenous opioids*

Endogenous opioids are substances produced by the body that mimic the effects of opioids such as heroin and morphine. Endogenous opioids are also called endorphins, because they can be considered to be endogenous morphine. The endogenous opioids and their receptors are widely distributed in the brain and the central nervous system.

Release of endogenous opioids and binding to receptors can produce analgesia and stress reduction. There is evidence that suggests that acupuncture provides pain relief by stimulating the release of endogenous opioids.12-14
Neurotransmitters
Animal research has shown that acupuncture can affect the secretion and release of the neurotransmitters norepinephrine, serotonin, and γ-aminobutyric acid. Changing the activity of these neurotransmitters could have an effect on pain perception and pain relief.

Nervous system
Acupuncture points are in close proximity to deep and superficial nerves, and in one study a response to acupuncture was prevented by an injection of a local anesthetic into an acupoint before needling. However, although some researchers have tried to associate the deep and superficial nerves, motor points, neuromuscular attachments, and large peripheral nerves with acupoints, no neural structure has been unequivocally linked to the acupoints.

Immune system modulation
Acupuncture has been used to treat allergies, rheumatoid arthritis, and multiple sclerosis, diseases that are caused, wholly, or in part, by alterations of immune system functioning. Experimental evidence suggests that electro-acupuncture can enhance immune system function by increasing the activity of natural killer cells and T-helper cells.

Hormonal system
One theory that has been used to explain the mechanism of action of acupuncture is its (possible) effects on the hormonal system and the stress hormones of the hypothalamus-pituitary-adrenal (HPA) axis. Decreased secretion of these hormones, such as adrenocorticotropic hormone (ACTH) and cortisol, stimulated by acupuncture, could
provide a mechanism of stress relief. As with all of the theories used to explain how acupuncture works there is conflicting evidence that both supports and refutes an effect of acupuncture on the hormonal system.\textsuperscript{21,22}

\textit{Muscular and connective tissue}

The practitioner often manipulates the acupuncture needles after they have been placed. The manipulation is intended to produce a response called \textit{de qi}; the patient feels an ache or heaviness in the area and the acupuncturist feels as if the needle is being grasped or tugged.\textsuperscript{23} This de qi effect is thought to be due to contraction or winding of the skin and/or connective tissue around the insertion site of the needle. Some researchers have speculated that this sends a mechanical signal that might cause release of cytokines (intercellular mediators that help generate an immune response) and vasoactive substances, influence intracellular signaling, influence blood flow, and activate sensory receptors.\textsuperscript{24}

\textbf{Placebo effect}

The word placebo is Latin and essentially means \textit{I shall please}. There are different definitions of the placebo effect. It can be explained as application of a treatment that has no known or proven effect that improves symptoms, or a therapeutic effect that occurs because of a patient’s expectations rather than from any property of the therapy. In simpler terms, the therapy itself has no proven mechanism of action but it works because the patient believes it will work.

The placebo effect in medicine is a well known phenomenon.\textsuperscript{25} It is very complex, and it involves many factors beyond disguising from a
patient which therapies are real and which are sham, and not all placebo treatments are equally effective. Because there is no convincing evidence for the existence of Qi, acupoints, or meridians, many people have long suspected that the placebo effect is the primary mechanism of action that explains the effectiveness of acupuncture.

The placebo effect and its role in acupuncture have been extensively studied. There are many studies that have found that sham acupuncture (placebo) is no better than real acupuncture, or that the difference between sham acupuncture and real acupuncture is very modest and probably clinically insignificant. There are also many studies that have found that sham acupuncture does not work and still others that have produced mixed results. This variation of opinion in varied studies is furthered by the nocebo effect that can occur in acupuncture.

The nocebo effect is caused by the administration of a perceived, sham, noxious stimuli that produce pain or another unpleasant sensation. Finally, some researchers have found that patient characteristics, expectation of the practitioner and the patient, setting, and other factors make a significant difference in the effectiveness of acupuncture while others have not.

There is no irrefutable evidence for any of these mechanisms of action. As a result of practical considerations, research in this area has focused primarily on the role of the placebo effect in acupuncture and, most often, in studies that have examined the analgesic effects of acupuncture. Unfortunately, methodological flaws, small study groups,
bias, and varying designs suggest that meaningful conclusions cannot be made about the existence or strength of the placebo effect in acupuncture. However, the placebo effect is operative in traditional Western medicine, and there have been reports of acupuncture being used successfully in veterinary medicine as well.

THE EFFECTIVENESS OF ACUPUNCTURE

Is acupuncture effective? Does it actually work? This is the second important question about acupuncture. However, unlike the mystery surrounding the mechanisms(s) of action of acupuncture, this question has at least been partially answered: there is a reasonable amount of evidence that suggests that acupuncture \textit{may} be a useful therapy for certain medical conditions. But how effective and for whom is not known.

The National Institutes of Health suggests that there is well-demonstrated evidence of the effectiveness of acupuncture for treating chemotherapy-induced nausea, dental pain, nausea associated with pregnancy, and post-operative nausea. The World Health Organization noted acupuncture has been shown through controlled trials to be an effective treatment for a wide range of medical problems. However, other professional organizations are less enthusiastic.

The National Cancer Institute has stated that the studies on the use of acupuncture to treat chemotherapy-induced nausea and vomiting are the most convincing. The American College of Rheumatology wrote that the evidence suggests acupuncture relieves pain only because it is a very strong placebo, and the Osteoarthritis Research Association lists acupuncture as a treatment of uncertain appropriateness.
Acupuncture has been used for dental, medical, orthopedic, psychiatric, and surgical problems. A full review of all of the applications of acupuncture is not practical in this study. This module will review recent (2012 to 2014) *selected* research on five conditions mentioned most often as successfully treated with acupuncture and for which there is reasonable evidence: for post-operative pain, to alleviate nausea and vomiting, and as a useful analgesic for treating people that suffer from headache, osteoarthritis, and lower back pain. The use of acupuncture for treating psychiatric conditions, smoking cessation, and substance abuse issues will be briefly discussed, as well.

**Post-operative pain**

Cho et al (2014) performed a systematic review and a meta-analysis of the literature to evaluate the effectiveness of acupuncture for treating post-operative pain after back surgery. The studies they examined were randomized controlled trials (RCTS) that compared acupuncture to sham acupuncture, conventional therapy, or no treatment. The authors concluded that acupuncture was effective as an analgesic in the first 24 hours after surgery, but it did not reduce the need for opioids.

The literature examined by Cho et al included RCTS, which used different procedures that are considered to be acupuncture (e.g., acupressure, acupuncture performed using laser or electrical stimulation) and some that used acupuncture plus conventional therapy. It also included studies with bias, incomplete data, and ones that were considered to be of low quality, and the total number of participants was small. Although Cho et al did state that acupuncture
had been shown to be effective as an analgesic they felt that the review did not find clear evidence for the effectiveness of acupuncture.

Acupuncture has also been used in the pediatric and adolescent patient population. Owi (2013) investigated the effectiveness of acupuncture for post-operative pain relief in pediatric and adolescent patients, ages 2 to 17, who had tonsillectomy performed.41 Thirty-one patients were given acupuncture and information about pain relief was obtained from either the patient or the parents. The mean level of pain prior to acupuncture was reported as 5.52 (standard deviation 2.28) out of 10, and this decreased to 1.92 (standard deviation 2.43) after acupuncture. Information about the duration of pain relief was incomplete (17 of 31 patients) and the duration of pain relief varied considerably. Thirty percent of the patients reported a duration of pain relief < than three hours, and 30% of the patients reported a duration of pain relief > 60 hours.

He et al (2013) studied the analgesic effect of auricular acupressure in patients who had total knee arthroplasty.42 Ninety patients were divided into a control group that received sham acupressure and a study arm that received auricular acupressure. The visual analogue scale was used to evaluate the effectiveness of acupressure. There was no difference between the groups when pain severity was measured at 12, 24, 36, and 48 hours post-operatively. The patients who received acupressure did report a greater level of pain relief at 3, 4, 5, and 7 days post-operatively, and these patients did use lower doses of analgesics than the control group.
Taghavi et al (2013) used acupuncture for post-operative pain relief in patients who had inguinal surgery. Ninety patients were divided into a control arm that received sham acupuncture and a study arm that received acupuncture. Both groups were given opioid analgesics as needed. The authors found that the patients who received sham acupuncture had higher levels of post-operative pain and need for analgesics than the patients who received acupuncture. In addition, the patients who received acupuncture reported fewer opioid-related side effects.

Langenbach et al (2012) used acupuncture as a post-operative pain control therapy for patients who had hemorrhoid surgery. Fifty patients were studied, and all 50 received conventional analgesia: topical lidocaine, oral non-steroidal inflammatory drugs, and a non-opioid analgesic. One third of the group received acupuncture, one third received sham acupuncture, and the remaining one third received only the conventional analgesia. Rescue analgesia with an opioid was used in all three groups as needed. The authors found that acupuncture did not provide superior pain relief compared to conventional analgesia alone. However, the group that was given acupuncture did have lower pain scores than the group that received sham acupuncture and they had less need for rescue analgesia than did the participants in the other two groups.

**Nausea and vomiting**

Tas et al (2014) investigated the use of acupuncture for the treatment of nausea and vomiting caused by chemotherapy. Forty-five patients received acupuncture one day prior to chemotherapy, the day chemotherapy was given and one day after chemotherapy. The
authors reported significant improvement. However, there was no control group, and improvement was based on a change from baseline, not alleviation of nausea caused by chemotherapy.

Genc and Tan (2014) compared the use of acupressure plus anti-emetics versus anti-emetics alone for the relief of nausea, vomiting, and anxiety in patients with breast cancer who were receiving chemotherapy. The length of the study was five days and there were 64 participants, divided into two groups. The authors found that acupuncture plus anti-emetics was significantly better than anti-emetics alone for relieving nausea. This difference was only noticeable on days 3, 4, and 5, and the incidence of vomiting was essentially the same for both groups.

The literature reviews have not been highly encouraging of the use of acupuncture for the treatment of nausea and vomiting. Lee and Ernst (2014) performed an overview of the systematic reviews of the use of acupuncture for surgical conditions. They located seven review articles with quality they rated as poor (significant difference between the means of two study groups): four of the seven had an OQAQ (Overview Quality Assessment Questionnaire) score of 1 (one). The authors concluded that acupuncture might be effective for the treatment of post-operative nausea and vomiting, but the effect was small and probably not clinically significant.

Cheong et al (2013) made a systematic review and a meta-analysis of 30 randomized controlled trials that had used acupuncture to treat post-operative nausea and vomiting. The authors’ analysis of the data was that acupuncture, acupressure, and electrical stimulation of
acupoints was effective at reducing post-operative nausea and vomiting, but the results were mixed. They pointed out that 15 of the studies involved the use of anti-emetics and acupuncture techniques, and that acupuncture *might* be beneficial in preventing post-operative nausea and vomiting.

Garcia et al (2013) reviewed 41 randomly controlled clinical trials for evidence of the effectiveness of acupuncture treating chemotherapy-associated nausea and vomiting.49 Their conclusion was that acupuncture is safe and inexpensive and appropriate as adjunctive care for chemotherapy-associated nausea and vomiting, but given the quality of the data more research is needed.

**Headache**

Foroughipour et al (2014) compared acupuncture versus sham acupuncture in patients for whom prophylactic drugs (the specific medications were not discussed in the article) had not produced a decrease of at least 50% in the number of attacks.50 One hundred patients were enrolled in the study: half received acupuncture and half received sham acupuncture. Prior to the acupuncture and sham acupuncture there was no difference between the groups in the frequency of migraine headaches.

The patients received 12 treatments, three per week, and they were evaluated at baseline and once a month for four consecutive months. The patients who received acupuncture had significantly fewer migraines at month one and month two. This effect decreased slightly for months three and four but was still considered significant at the end of the study.
Fofi et al (2014) used acupuncture to treat four patients who had cluster headaches. The patients were treated twice a week for two weeks, once a week for eight weeks, and, once a week for two weeks, alternating. All four patients had been taking verapamil prior to the study and all four continued with its use concurrent with the acupuncture treatments. The authors reported that there was a sustained resolution of the attacks and, when the cluster headaches returned, the frequency was greatly decreased (e.g., one to four a month from one to four a day). The authors also reviewed the literature and concluded that the data, though sparse, provided support for the use of acupuncture to treat cluster headaches.

Pang et al (2013) studied 66 patients who suffered from migraine headaches, giving one-half of the study group acupuncture and one-half topiramate. They found that patients who had a high baseline number of migraine headaches (> 20 per month) had a median change in the mean number of moderate-to-severe headache days per week. The patients who had throbbing migraine headaches responded better to acupuncture and the authors reported that, in both groups, high expectations for treatment influenced success.

Dietzel et al (2013) used acupuncture to treat five patients who had post-dural headache. Two patients had a spinal block, three had accidental dural puncture that occurred during spinal anesthesia, and none of the patients obtained relief from what the authors called standard therapy: acetaminophen, diclofenac, ibuprofen, and tramadol. All five patients reported a 50% decrease in pain immediately after acupuncture and analgesics were stopped or the doses reduced for all five as well.
Planck et al (2013) administered acupuncture to 59 patients who were diagnosed with migraine. The patients received acupuncture twice a week for four weeks and then once a week for four weeks. Each patient used a diary to record the number of headaches they had and also several migraine quality-of-life measurements. This was done for 12 weeks prior to the beginning of acupuncture therapy during the therapy, and for 12 weeks after the last acupuncture treatment. In addition the Migraine Disability Assessment, Headache Impact Test, and Beck Depression Inventory were completed 12 weeks before the first acupuncture treatment, immediately before the first treatment, and 12 weeks after the final treatment. The authors reported that the frequency and intensity of migraines was significantly decreased, and this effect was still evident 12 weeks after the final acupuncture treatment.

**Osteoarthritis**

Asharaf et al (2014) compared the effectiveness of acupuncture or a lateral wedge insole in 40 patients who had either grade two or grade three medial knee osteoarthritis. Twenty patients used the lateral knee wedge for months, and 20 patients received acupuncture, three sessions a week for three weeks. The patients’ level of pain, their knee function, and knee cartilage thickness were evaluated at the end of the treatment protocols. Both groups had significant improvement in all three outcomes; there were no significant differences between the groups.

Corbett et al (2013) performed a meta-analysis of acupuncture and other physical therapies for the treatment of pain caused by knee osteoarthritis. The authors reviewed 114 trials that involved 22
different therapies and 9709 patients. They concluded that when compared to standard therapies (e.g., analgesics, exercise, weight reduction) acupuncture produced a statistically significant reduction in pain. However, they also noted that the research was of poor quality, had a high risk of bias, and only studied short-term effects.

Chen et al (2013) studied the effects of acupuncture and non-penetrating acupuncture in 214 patients who had knee pain and clinical evidence of osteoarthritis. The patients received 12 treatments of acupuncture or non-penetrating acupuncture. These treatments followed exercise-based physical therapy, and the treatment duration was 6 to 12 weeks. All patients reported an improvement in pain, but there was no statistically significant difference in pain relief between the patients who received acupuncture and those who received non-penetrating acupuncture.

Saleki et al (2013) compared the effect of acupuncture and isometric exercise for pain relief and knee function in 40 patients who had osteoarthritis of the knee. Patients were treated with 12 sessions of acupuncture or 12 sessions of isometric exercise, total treatment duration of four weeks. Both groups reported significant reduction in pain, improvement in quality of life, and it was determined that knee function significantly improved as well. There were no clinically significant differences in these outcomes between the two groups.

Allam and Mohammed (2013) use scalp acupuncture to treat 30 females, age ranging from 30-80, all of whom had chronic pain caused by osteoarthritis. Each patient received a single, 20 minute treatment with scalp acupuncture, and their level of pain was assessed.
using the Visual Analogue Scale before the treatment and one hour after the end of the treatment. All patients reported a decreased level of pain that the authors reported as clinically significant when compared to the pre-treatment level. The treatment worked best for patients who had osteoarthritis of the neck.

**Lower back pain**

Bahrami-Taghanaki et al (2014) used different acupuncture therapies to treat 66 patients who suffered from chronic low back pain. They reported significant reductions in the level of pain experienced by the patients fewer pain relapses 12 weeks after the treatment sessions concluded. The patients received acupuncture only; there was no comparison with no treatment or other therapies.

Hasegawa (2014) compared scalp acupuncture and sham acupuncture as treatments for acute low back. Eighty patients, divided into an intervention group and a sham group, received treatments of scalp acupuncture or sham acupuncture. The patients were evaluated at baseline and at 3, 4, 7, 21 and 28 days using the Visual Analogue Scale (pain assessment), function, quality of life, improvement in pain, and, number of analgesics used. The intervention group had higher scores in cumulative pain, function, limitations of physical ability, functional capability, and number of analgesics used. Pain intensity, as measured by the Visual Analogue Scale, did not significantly improve for the intervention group.

Taylor et al (2013) did a meta-analysis of the literature to determine the cost-effectiveness of acupuncture as a treatment for chronic low back pain. They concluded that acupuncture is not a cost-effective
treatment for low back pain unless patients suffered from morbid depression as well. Their review also noted that although acupuncture plus standard care was superior to standard care alone for low back pain, but that the positive effect of acupuncture was weak and insignificant when compared to sham acupuncture. They also found that the positive effect of acupuncture alone versus standard care alone was initially strong but did not persist.

Lam et al (2103) did a systematic review and meta-analysis of the literature to evaluate the effectiveness of acupuncture as a treatment for chronic non-specific low back pain.63 Twenty-five randomly controlled studies were included, and the conclusions were: 1) acupuncture produced clinically meaningful reduction in self-reported pain when compared with sham acupuncture; 2) acupuncture increased level of function when compared to no treatment or compared to standard care alone, and; 3) acupuncture was not significantly better than treatment with standard care or medications (analgesics, non-steroidal anti-inflammatories, and muscle relaxers).

Hitchinson et al (2012) performed a systematic review of the literature from 1950-2011 that had studied the use of acupuncture for the treatment of low back pain.64 They found seven randomized, controlled studies that fit the inclusion criteria. The authors found evidence that acupuncture was better than standard therapies or no treatment for relieving low back pain, but there was an equal amount of evidence that it was not. They stated that no conclusion could be made about the effectiveness of acupuncture as compared to no treatment since the evidence was conflicting.
SMOKING CESSATION, SUBSTANCE ABUSE, AND PSYCHIATRIC ISSUES

Acupuncture has long been promoted as a treatment for smoking cessation. Recent research however is not supportive of its effectiveness for this purpose. White et al (2014) performed an analysis of the literature and located 38 studies that had compared a form of acupuncture, acupressure, laser therapy, or electro-stimulation with either no treatment, sham treatment or other interventions for smoking cessation. They found that acupuncture was less effective than nicotine replacement therapy and no evidence that it was superior in the short or long-term to psychological interventions.

There was limited evidence that acupressure is superior to sham acupuncture, but the effect was short-term, not long-term. Continuous auricular acupressure did show a short-term benefit that was superior to sham. The authors concluded that pooled estimates suggest a possible short-term effect, but the lack of evidence, degree of bias, and methodological problems in these studies prevent useful conclusions from being drawn.

The conclusions of White et al are supported by Tahiri et al (2012) who reviewed six randomized, controlled trials that used acupuncture for smoking cessation. Eight hundred twenty-three patients were enrolled in these trials. Some of the trials reported good results, e.g., 55% rate of smoking cessation in patients who received acupuncture versus 4% who did not. However, some of the studies produced much less impressive cessation rates and in one the group that received acupuncture fared worse than the control group. All of the studies had a follow-up time of ≤ six months. After reviewing the evidence from
these trials, the authors’ conclusions were that there was a suggestion that acupuncture could be a useful way of achieving smoking cessation, but more evidence is needed.

Acupuncture has been used to treat substance abuse and the signs and symptoms of drug withdrawal since 1972, and acupuncture is in wide use in addiction programs around the world. The National Acupuncture Detoxification Association (NADA) in the United States has been in operation since 1985, and some addiction centers treat hundreds of patients every day using the NADA protocol of five acupuncture needles placed in the auricle (outer ear).

Unfortunately, the basic issues of acupuncture as a therapy - how it works, if it works, and the lack of good research that provides an answer to these questions - are operative in the use of acupuncture as treatment for substance abuse/withdrawal. Acupuncture may diminish the discomfort of drug withdrawal by causing a release of monoamines and endorphins, neurotransmitters that can block pain signals. It may also affect some of the neural structures and pathways that are thought to be involved in addictive behavior. However, these mechanisms of action are theoretical and unproven.

And although acupuncture is relatively popular as a treatment for substance abuse/withdrawal, much of the available research was poorly designed, there are numerous studies with negative outcomes, and the available data is inconclusive.\textsuperscript{67-71} Two recent (2013, 2014) studies illustrate these problems.
Bergdahl et al (2014) enrolled 17 patients who were going through substance withdrawal and all 17 were given auricular acupuncture, twice a week for five weeks. At the end of the study period, patients reported reduced craving, reduced level of anxiety, and an increased sense of relaxation and well-being.72 Lua et al (2013) reported on the use of acupuncture as an adjunct for treating patients who were on methadone maintenance.73 Forty patients were maintained on the standard methadone maintenance treatment (details of this were not provided) and twenty-nine received methadone maintenance plus three auricular acupuncture treatments week for a duration of two months.

After the end of the study, the authors concluded that auricular acupuncture did not increase patient satisfaction or coping skills. In both studies the number of patients is small, there are important details that are not reported, the end-point of therapy is in part self-reported symptoms, and one study found a positive benefit of acupuncture while the other did not.

In traditional Chinese medicine, psychiatric disorders are caused by an imbalance/disharmony between the five spirits. The five spirits are energies that regulate the psyche and emotions, e.g., Hun is the energy that is responsible for benevolence, compassion, empathy, etc. When these are imbalanced, the acupuncturist attempts to unblock energy and redirect its flow.74

Acupuncture has been used as a primary adjunct for the treatment of many psychiatric disorders, most commonly for anxiety and depression. The research typically involves small studies that are not
well designed. Reviews and meta-analyses of the randomized controlled trials have not found conclusive evidence that acupuncture is effective for treating psychiatric conditions.

Smith et al (2010) reviewed 30 randomized, controlled trials involving 2812 patients/participants. The trials involved comparing acupuncture with sham acupuncture, pharmacologic treatment, psychotherapies, or no treatment for patients with depression. The authors stated that the majority of the studies had a high risk of bias and there “was insufficient evidence to recommend the use of acupuncture for people with depression.”

Some researchers support the use of acupuncture for treating psychiatric disorders. Hopton et al (2014) studied patients who received either acupuncture (302 patients), counseling (302 patients), or what they described as the usual care (medications plus secondary mental health facilities, 151 patients) for the treatment of self-reported symptoms of depression and pain. They found that the patients who were treated with acupuncture has the most marked reductions in depression and pain.

Reilly et al (2014) treated 37 healthcare workers with a single auricular acupuncture session. Baseline levels of self-reported a caring ability (e.g., courage, knowledge, patience), anxiety, and professional quality of life (e.g., burnout, compassion satisfaction), which were measured before and after the acupuncture. The levels of anxiety and some of the aspects of one’s caring ability and professional quality of life were significantly improved after the acupuncture. And Sniezek and Siddiqui (2013) stated that the uses of
acupuncture for treating major depressive disorder in pregnant women produced a high level of evidence of its effectiveness.\textsuperscript{79} These three studies had small numbers of patients and relied heavily on the self-reporting of symptoms and effectiveness of the therapy.

**CONTRAINDICATIONS, COMPLICATIONS AND ADVERSE EFFECTS OF ACUPUNCTURE**

Acupuncture is contraindicated for treating malignant tumors, in patients with bleeding disorders, and for the treatment of trauma or surgical emergencies. Some practitioners feel that pregnancy is a contraindication (there is a risk of inducing contractions) but others feel it can be used safely in these situations if the acupuncturist is well trained.

Acupuncture is often perceived and described as very safe, and the nature and the incidence of complications and adverse effects support this perception. Several large-scale studies have shown that acupuncture has a very low incidence of adverse events or side effects when a well-trained practitioner performs it. For example, a study of 760,000 acupuncture treatments reported only six adverse events (e.g., pneumothorax) and a study of 2.2 million acupuncture treatments found only 2 adverse events.\textsuperscript{7}

A 2013 systematic review of the literature reported 308 adverse events; the majority, 284, were bacterial skin infections.\textsuperscript{80} Minor effects such as nausea, vomiting, emotional or psychological reactions to the treatment, or prolonged aggravation of existing symptoms have been reported as 0.1- 1.1 cases per 10,000 treatments.\textsuperscript{12} Minor bleeding was reported to occur in 3\% of patients in one large study.
and in 0.7% in another. For individual acupuncture practitioners, the rate of bleeding ranged from 0% to 53%. \(^{81,82}\)

Other adverse effects include a needle that was lost or forgotten, a burn caused by moxibustion, cellulitis, fainting, sweating, anxiety, dizziness, headache drowsiness, vomiting, and aggravation of the initial complaint. Serious adverse events that have been reported include pneumothorax, metal allergy, cardiac tamponade, penetration of the abdominal viscera, damage to peripheral nerves, damage to the spinal cord or spinal nerve roots, damage to peripheral blood vessels, pancreatitis, and infectious complications, such as, hepatitis B, abscesses, septicemia, and HIV.\(^{83,84}\) Of course, one risk of acupuncture is continued use of it when other treatments would be more effective.

**SUMMARY**

Evaluating the effectiveness of acupuncture is difficult. Pain relief is one of the primary uses for acupuncture. But pain is a complicated phenomenon that is also highly subjective, making evaluation of the effectiveness of pain relief therapies very difficult. Also, any research that studies the effectiveness of pain relief treatments must depend in part on self-reporting by the patient, and this presents obvious problems if research is to be accurate.

The placebo effect undoubtedly plays a role in the effectiveness of acupuncture, but the placebo effect itself is very complex and it is operative in Western medicine as well. And patients who are having pain might not care if the relief is physical or due to a placebo.
At this point it would be reasonable to say that acupuncture is safe, relatively inexpensive, and many people find it to be effective. It would also be reasonable to say that the mechanism of action of acupuncture is not known and the research only suggests that it is an effective treatment for pain, nausea, vomiting, and other medical problems. Also, a common theme in many of the case studies and controlled trials that investigate the effectiveness of acupuncture is a relatively poor quality of research.

Current constraints in the existing research on acupuncture limits the usefulness of the data and, consequently, conclusions about the effectiveness or non-effectiveness of acupuncture cannot be reached. Despite years of use and thousands of studies, it is still not known how acupuncture works.

Please take time to help the NURSECE4LESS.COM course planners evaluate nursing knowledge needs met following completion of this course by completing the self-assessment Knowledge Questions after reading the article. Correct Answers, page 37.
1. **Acupuncture is thought to work by:**
   a. The manipulation of the life force Qi
   b. Affecting the circulation to vital organs
   c. Altering magnetic currents
   d. Increasing the activity of meridians

2. **Acupuncture is performed by inserting needles into specific areas called:**
   a. Meridians
   b. Acupoints
   c. Pressure points
   d. Azimuths

3. **Which of these has been identified as a mechanism of action of acupuncture?**
   a. Changes in microcirculation
   b. Increasing oxygen carrying capacity
   c. Influencing the patient by the placebo effect
   d. Decreasing the release of endogenous opioids

4. **There is some reasonable evidence for using acupuncture to treat:**
   a. Headache
   b. Hematomas
   c. COPD
   d. Reflux
5. There is some reasonable evidence for using acupuncture to treat:
   a. Angina
   b. Bronchitis
   c. Low back pain
   d. Thyroid disorders

6. There is some reasonable evidence for using acupuncture to treat:
   a. Gallstones
   b. Dysphagia
   c. Deep vein thrombosis
   d. Nausea and vomiting

7. The most common adverse event caused by acupuncture is:
   a. Pneumothorax
   b. Infection
   c. Thromboembolism
   d. Hematoma

8. Common side effects of acupuncture include:
   a. Nausea
   b. Blurred vision
   c. Chest pain
   d. Cough
9. Common side effects of acupuncture include:
   a. DVT
   b. Constipation
   c. Dizziness
   d. Hyperglycemia

10. Which of these is a contraindication for acupuncture?
   a. Lung disease
   b. Bleeding disorders
   c. Heart disease
   d. Gallbladder disease

CORRECT ANSWERS:

1. A
2. B
3. C
4. A
5. C
6. D
7. B
8. A
9. C
10. B
Footnotes:


