



# Other complementary and alternative medicine modalities: acupuncture, magnets, reflexology, and homeopathy

Janet S. Carpenter, PhD, RN,<sup>a</sup> Jennifer G. Neal, BS<sup>b</sup>

<sup>a</sup>School of Nursing, Indiana University, Indianapolis, Indiana, USA; and

<sup>b</sup>Walther Cancer Institute, Inc., Indianapolis, Indiana, USA

## KEYWORDS:

Acupuncture;  
Homeopathy;  
Hot flashes;  
Magnets;  
Menopause;  
Reflexology

We sought to evaluate evidence for the benefits and risks of acupuncture, magnets, reflexology, and homeopathy for menopause-related symptoms. Search strategies included electronic searches of online databases (PubMed, PsycINFO, Medline), direct searches of target journals, and citation-index searches. A total of 12 intervention studies were identified for review. Complementary and alternative medicine (CAM) treatments resulted in few side effects. The design, study populations, and findings across acupuncture studies varied. In uncontrolled studies, acupuncture improved subjective measures of hot flash frequency and vasomotor, somatic, physical, and psychological symptoms; however, improvements were not consistent. Controlled studies of acupuncture yielded even less consistent findings. Overall, controlled studies of acupuncture did not reliably improve hot flashes, sleep disturbances, or mood when compared with nonspecific acupuncture, estrogen therapy, or superficial needling. Homeopathy significantly improved subjective measures of hot flash frequency and severity, mood, fatigue, and anxiety in uncontrolled, open-label studies. Controlled studies of magnets and reflexology failed to demonstrate any increased benefit of treatment over placebo. There is a need for additional investigations of acupuncture and homeopathy for the treatment of hot flashes and other menopausal symptoms. However, existing evidence does not indicate a beneficial effect of magnets or reflexology in the treatment of hot flashes and other menopausal symptoms. Understanding whether, for whom, and how these interventions work is crucial to building the evidence base needed to evaluate any potential for these CAM therapies in the management of menopause-related symptoms.

© 2005 Elsevier Inc. All rights reserved.

The aging population of the United States<sup>1</sup> and findings from the Women's Health Initiative (WHI) that indicate a

The opinions offered at the National Institutes of Health (NIH) State-of-the-Science Conference on Management of Menopause-Related Symptoms and published herein are not necessarily those of the National Institute on Aging (NIA) and the Office of Medical Applications of Research (OMAR) or any of the cosponsoring institutes, offices, or centers of the NIH. Although the NIA and OMAR organized this meeting, this article is not intended as a statement of Federal guidelines or policy.

Publication of the online supplement was made possible by funding from the NIA and the National Center for Complementary and Alternative Medicine of the NIH, US Department of Health & Human Services.

Requests for reprints should be addressed to Janet S. Carpenter, PhD, RN, Indiana University, School of Nursing, 1111 Middle Drive NU340D, Indianapolis, Indiana 46202.

E-mail address: carpentj@iupui.edu.

shift in the risk-benefit balance of hormone therapy<sup>2–8</sup> have created a growing interest in complementary and alternative medicine (CAM) treatments for hot flashes. Healthy women as well as those taking medications such as tamoxifen and lupron—used in the prevention or treatment of hormonally dependent cancers—who experience hot flashes need and seek safe and effective treatments for symptom relief.<sup>9–11</sup> In addition, men with prostate cancer who experience hot flashes from androgen-deprivation therapy also need proven therapies.<sup>12</sup>

Numerous scientific and lay publications attest to the possible benefits of CAM modalities, including acupuncture, magnets, reflexology, and homeopathy.<sup>13–17</sup> However, these clinical recommendations are often made in the absence of clear empiric evidence of either safety or efficacy.

Irrespective of the evidence base, epidemiologic data suggest that consumers are using CAM for treating hot flashes and other menopausal symptoms and often do so based on the advice of a medical professional. In a recent National Health Interview Survey (NHIS) of 31,044 adults conducted by the Centers for Disease Control and Prevention (CDC), approximately 1% of adults who used CAM during the prior 12 months reported doing so to treat menopausal symptoms.<sup>18</sup> In addition, the NHIS survey found that approximately 25% of adult users sought CAM therapies based on the recommendations of a conventional healthcare professional (e.g., nurse, physician).<sup>18</sup> In another survey of 886 menopausal women, 76% reported using CAM, and 22% used  $\geq 1$  CAM therapies specifically for menopausal symptoms.<sup>19</sup> Homeopathy was the most frequently used CAM modality for menopausal symptoms (13%).<sup>19</sup> Acupuncture was used by <1% of women for menopausal symptoms but had been used at least once by 10% of subjects for other reasons.<sup>19</sup> In addition, 61% of respondents agreed that they preferred CAM modalities to hormone therapy.<sup>19</sup>

The purpose of this review was to evaluate evidence for the benefits and risks of commonly used CAM interventions for managing menopause-related symptoms, including acupuncture, magnets, reflexology, and homeopathy. The modalities reviewed here have typically been absent from other reviews of alternative therapies for menopausal symptoms, which have focused primarily on dietary supplements, such as soy and black cohosh.<sup>20,21</sup> They are also absent from the evidence-based recommendations for treating menopausal symptoms recently published by the North American Menopause Society (NAMS).<sup>22</sup>

## Materials and methods

We used 3 search strategies in our investigation. First, we conducted searches for all literature published from January 1, 1950, through December 31, 2004, using PubMed and Medline and from January 1, 1985, through December 31, 2004, using PsycINFO. Key words used for treatment searches included *acupuncture*, *acupressure*, *magnets*, *reflexology*, and *homeopathy*; additional searches were conducted of treatment terms combined with *hot flashes*, *hot flushes*, *night sweats*, *vaginal dryness*, *vaginal atrophy*, *vaginal bleeding*, and *menopausal symptoms*. Articles published in languages other than English were included. All potentially relevant articles were identified, and full text articles were obtained and examined by both authors. A total of 29 relevant articles were identified using these search strategies. For comparison purposes, we also used the Google search engine to look for key words that might help identify additional articles. In addition, relevant specialty journals were identified, and direct index searches were conducted for available journals. Two additional articles were identified in this manner. Finally, we reviewed the reference lists of all obtained articles and found 1 additional

reference. The majority of reports represented review articles or clinical recommendations. These were reviewed by both authors but were not included in the evaluation. In total, the combined search strategies yielded 12 intervention studies, all included here regardless of level of evidence or quality of design.

Studies were evaluated in the following manner. Both authors independently read and evaluated each of the 12 intervention articles. The second author extracted information and compiled it in tabular format based on study purpose, intervention condition, control or comparison condition, design, sample, sample size, outcome measures, and results. The first author then verified accuracy of the extracted information. Following completion and verification of the table, the authors discussed similarities and differences across studies and within those treatment modalities for which >1 study was available (e.g., acupuncture, homeopathy).

## Results

Shown in **Table 1** are summaries of the 12 identified intervention studies. The intervention studies represented 8 reports evaluating acupuncture,<sup>23–30</sup> 1 on magnetic therapy,<sup>31</sup> 1 on reflexology,<sup>32</sup> and 2 on homeopathy.<sup>33,34</sup> No articles on acupressure for menopausal symptoms were found.

## Acupuncture

We divided the acupuncture studies into 2 categories, controlled and uncontrolled. There were 3 uncontrolled acupuncture studies that demonstrated favorable effects on subjective measures of hot flash frequency<sup>25</sup> and mean scores for vasomotor and physical/somatic symptoms.<sup>24,27</sup> Although 1 uncontrolled study did not show significant improvement in psychosocial symptoms after 5 weeks of acupuncture,<sup>24</sup> another reported significant improvement in anxiety and depression after 12 weeks of treatment.<sup>27</sup> Intervention designs and sample characteristics were not the same across studies, but all had small sample sizes. One study used 5 biweekly sessions of 40 minutes' duration in a sample of 11 healthy women.<sup>24</sup> Others used a combination of 14 weekly and biweekly 30-minute sessions in a sample of 6 men with prostate cancer<sup>25</sup> and 12 weekly sessions for 15 female breast cancer survivors taking tamoxifen.<sup>27</sup> However, uncontrolled reports should be interpreted cautiously because some control groups have been noted to demonstrate improved outcomes over time.<sup>23,26,29</sup>

Findings from controlled studies of acupuncture for menopause-related symptoms were less consistent. Acupuncture did not consistently improve hot flashes, menopausal symptoms, sleep, or mood when compared with nonspecific acupuncture, estrogen therapy, or superficial needle insertion.<sup>23,26,28–30</sup> For example, when compared

**Table 1** Critique of intervention studies (continued on page 112S)

Study	Intervention	Control/Comparison	Sample	Measures				Results
				Objective HF Frequency	Subjective HF Frequency	HF Severity or Distress	Other	
Acupuncture Cohen et al <sup>23</sup>	Needling for 9 sessions at 20–30 min; 1×/wk for 3 wk then 1×/2 wk for 6 wk then 3 wk without treatment	Needling alternate general tonic points using same schedule	17 women	No	No	0–3 severity in daily symptom diary	0–3 severity of mood changes and sleep disturbance in daily symptom diary	From baseline to 3 mo, experimental group showed 30% decrease in HF severity and improvement in sleep disturbance, but control group showed no significant change. Mood improved in both groups over time.
Dong et al <sup>24</sup>	Needling for 40 min 2×/wk for 5 wk	None	11 women	No	No	0–6 distress on symptom scale	Vasomotor, physical, psychosocial, and sexual symptom bother; serum LH, FSH, prolactin, estradiol, progesterone	Mean vasomotor and physical symptoms decreased at end of treatment ( $P < 0.02$ ) and at 3-mo follow-up ( $P < 0.05$ ). No change in mean psychosocial or sexual symptoms. Individual items related to dissatisfaction with personal life and being inpatient with people improved at end of treatment ( $P < 0.05$ ). No change in serum hormones.
Hammar et al <sup>25</sup>	Acupuncture 2×/wk for 30 min for 2 wk then 1×/wk for 30 min for 10 wk	None	6 men with vasomotor symptoms due to castration therapy	No	Daily summaries	No	None	Compared with baseline, hot flashes significantly decreased after 6, 10, and 24 wk of treatment (>50% reduction, $P < 0.01$ ).

**Table 1** Critique of intervention studies (continued on page 113S)

Study	Intervention	Control/Comparison	Sample	Measures				Results
				Objective HF Frequency	Subjective HF Frequency	HF Severity or Distress	Other	
Ping et al <sup>26</sup>	Needling for 20 min daily or every other day, manipulating needles every 5 min with ear pressing	Estriol 1–4 mg orally for 3 wk, 1 wk off, repeat; vitamin B <sub>6</sub> 20 mg, diazepam (dose?)	56 women	No	No	No	Kupperman Index, 11 symptoms; serum FSH, LH, estrogen (n = 8 acupuncture recipients)	Both groups significantly improved over time, but greater improvement in menopausal symptoms was seen in the acupuncture group ( $P < 0.01$ ). FSH and LH, but not estrogen, decreased with acupuncture ( $P < 0.01$ ).
Porzio et al <sup>27</sup>	Traditional Chinese acupuncture weekly for 3 mo (12 total)	None	15 female survivors of breast cancer taking tamoxifen	No	No	No	Greene Menopause Index	After 3 mo of treatment, significant improvements in anxiety, depression, and somatic and vasomotor symptoms was seen over baseline ( $P < 0.001$ ).
Sandberg et al <sup>28</sup>	Needling 5–20 mm with twirling and electrical stimulation for 14 treatments over 12 wk, 30 min 2×/wk for 2 wk, then 1×/wk for 10 wk	Superficial needle insertion only (<5-mm depth)	30 women	No	No	No	Mood (Mood Adjective Checklist), general psychological well-being (SCL-90), Greene Climacteric Index	Compared with control group, intervention group reported improved mood after 12-wk treatment ( $P < 0.05$ ) and at 6 mo after treatment ( $P < 0.01$ ). No other significant group differences.

**Table 1** Critique of intervention studies (continued on page 114S)

Study	Intervention	Control/Comparison	Sample	Measures				Results
				Objective HF Frequency	Subjective HF Frequency	HF Severity or Distress	Other	
Wyon et al <sup>29</sup>	Electroacupuncture at 2 Hz with needles rotated and depth of 1.25–2.5 cm, for 30 min; 2×/wk for 2 wk then 1×/wk for 6 wk	Superficial needle insertion only	21 women	No	Daily summaries	Daily summaries of number that were slight, moderate, or severe	Psychological well-being index, sleep dysfunction test, menopausal symptoms (modified Kupperman Index for patient and physician), urinary neuropeptides	No significant group differences on any outcomes. Both groups improved over time (e.g., >50% reduction in HF frequency in both groups).
Wyon et al <sup>30</sup>	Electroacupuncture at 2 Hz with needles rotated and depth of 5–20 mm, for 30 min; 2×/wk for 2 wk then 1×/wk for 10 wk or estradiol 2 mg/day orally for 12 wk	Superficial needle insertion (≤1-mm depth)	45 women	No	Daily summaries	Daily summaries using 0–10 scale	Menopausal symptoms (Kupperman Index), total climacteric symptom intensity and distress 0–10 scale	Estrogen group had a significant decrease in symptoms over time compared with other 2 groups. No significant difference between electroacupuncture and superficial needle insertion groups on any outcome. Both groups significantly improved over time.
Magnets Carpenter et al <sup>31</sup>	Magnetic devices on 6 acupressure sites for 3 days (10-day washout, crossover to placebo)	Placebo devices on 6 sites for 3 days (10-day washout, crossover to treatment)	11 breast cancer survivors	Sternal skin conductance	Prospective daily diary	Prospective daily severity and distress (both) ratings using 0- to 10-point rating scales	HF daily interference, overall quality of life.	Compared with magnets, placebos significantly decreased objective HF frequency (10.45–6.64) and subjective HF distress (4.40–3.21). No group differences in other measures.

**Table 1** Critique of intervention studies

Study	Intervention	Control/Comparison	Sample	Measures				Results
				Objective HF Frequency	Subjective HF Frequency	HF Severity or Distress	Other	
Reflexology Williamson et al <sup>32</sup>	Precision reflexology for 45 min/wk for 6 wks, then monthly for 3 mo (9 sessions total)	Predefined foot massage with no reflexology, same schedule	66 women	No	Categories of 0–5, 6–10, 11–15, 16–20, >20	Single item severity 0–100 mm VAS	Psychological and physical well-being (WHQ) anxiety and depression scales; symptoms list: somatic, vasomotor, memory, concentration, sleep problems, menstrual attractiveness, sexual behavior	No significant group differences. Both groups improved over time (all outcomes).
Homeopathy Clover and Ratsey <sup>33</sup>	“Normal homeopathic treatment” included amyl nitrosum, calcium carbonate, <i>Lachesis</i> , natrium mur, <i>Pulsatilla</i> , <i>sepia</i>	None	31 women (20 were breast cancer survivors)	No	Recalled average as occasional (1–3 in 24 hr), moderate (4–8 in 24 hr), frequent (>8 in 24 hr)	Severity recalled average as slight, moderate, severe	None	Compared with baseline, during 1 yr treatment group reported 48%–75% decrease in frequency and 53%–73% decrease in severity.
Thompson and Reilly <sup>34</sup>	60-min consultation with individualized treatment regimen	None	45 patients with breast cancer	No	No	Single item distress 0–10	Impact of 3 primary symptoms on daily life and overall well-being (0–10 point scale), anxiety and depression (HADS), quality of life (EORTC QLQ-30)	Significant improvement in all 3 primary symptoms ( $P < 0.03$ ): effect on daily life ( $P < 0.001$ ), HF ( $P < 0.001$ ), mood ( $P < 0.001$ ), fatigue ( $P < 0.05$ ), other symptoms ( $P < 0.001$ ), anxiety ( $P < 0.01$ ), and marginal improvement in depression ( $P = 0.07$ ), quality of life ( $P = 0.05$ ) and quality of health ( $P = 0.05$ ).

EORTC QLQ-30 = European Organisation for the Research and Treatment of Cancer 30-item quality-of-life questionnaire; FSH = follicle-stimulating hormone; HADS = Hospital and Anxiety Depression Scale; HF = hot flash; LH = luteinizing hormone; SCL-90 = Symptom Checklist-90; WHQ = Women’s Health Questionnaire; VAS = Visual Analogue Scale.

with placebo, acupuncture significantly improved hot flash severity in 1 study<sup>23</sup> and menopausal symptoms such as paresthesias, insomnia, nervousness, joint pain, or headache in another study.<sup>26</sup> However, electroacupuncture did not improve hot flash frequency, severity, and/or similar menopausal symptoms in 3 other studies.<sup>28–30</sup> In addition, compared with placebo, electroacupuncture significantly improved mood in 1 study,<sup>28</sup> but neither acupuncture nor electroacupuncture improved mood or psychological well-being in 2 other studies.<sup>23,29</sup> Similarly, acupuncture significantly improved sleep compared with placebo,<sup>23</sup> but electroacupuncture did not.<sup>29</sup>

Comparisons across studies were hampered by differences in the type, technique, and timing of acupuncture treatment.<sup>23–29</sup> Treatments included needling,<sup>23,24</sup> needling with unspecified manipulation of needles every 5 minutes and ear pressing,<sup>26</sup> traditional Chinese acupuncture (not otherwise described),<sup>27</sup> and electroacupuncture with rotation of needles during insertion.<sup>28,29</sup> In addition, needle insertion depth was specified in only 3 studies and varied from 5 mm to 250 mm.<sup>28–30</sup> The length of time for needle insertion was either unspecified<sup>27</sup> or varied from 20 to 40 minutes,<sup>23,25,26,28,29</sup> and body points used for needle placement varied. Although 5 of 8 studies used similar to identical body points, differences in the intervention conditions in terms of the type of acupuncture applied (acupuncture versus electroacupuncture), specific needle technique (depth and rotation of needles), timing of intervention delivery (frequency and total number of sessions), and choice of control condition (Western medicine, alternate acupuncture points, or superficial needle insertion) interfered with comparisons across studies.<sup>23,25,28–30</sup> Differences in the timing of intervention delivery extended to all studies.<sup>23–30</sup> Participants received acupuncture treatments weekly, twice weekly, or a combination of weekly and twice weekly, with a range of 9 to 14 total sessions.<sup>23–30</sup>

Outcomes and their measures also varied across studies. Key outcomes included hot flashes,<sup>23–25,29,30</sup> other menopausal symptoms as measured by the Greene or Kupperman symptom checklists (e.g., paresthesias, insomnia, headache, nervousness, irritability),<sup>24,26–30</sup> mood and/or psychological well-being,<sup>23,28,29</sup> and sleep.<sup>23,29</sup> In addition, the measurement of hot flashes and other outcomes varied greatly across studies. Hot flash frequency was either not assessed at all<sup>23,24,26–28</sup> or was assessed subjectively using daily diaries of summed frequency and/or severity.<sup>25,29,30</sup> Similarly, hot flash severity was assessed daily using a 3-point rating scale<sup>23</sup> or summed rating.<sup>29,30</sup> Other studies evaluated vasomotor symptoms as an overall recalled average during a given period of time using questionnaires or symptom checklists.<sup>24,26–30</sup> Only 1 study included an assessment of hot flash-related bother or distress.<sup>24</sup> To evaluate outcomes other than hot flashes, most studies used subject-completed questionnaires or symptom checklists. However, 1 study included physicians' and nurses' assessments of patients' vasomotor symptoms as an outcome measure.<sup>29</sup>

In addition, although several studies provided some indication of potential mechanisms of action for acupuncture, hypotheses were not always tested. Studies suggested that acupuncture may increase central  $\beta$ -endorphin secretion and modulate the negative effects of hormones and/or neuropeptides potentially involved in hot flash physiology. Although 1 study found no change in serum hormones after 5 weeks of acupuncture treatment in 11 healthy women,<sup>24</sup> another found significant decreases in follicle-stimulating hormone and luteinizing hormone after acupuncture treatments in 8 healthy women.<sup>26</sup> Results from another study suggested that although urinary neurokinin A and calcitonin gene-related peptide (2 neuropeptides involved in inflammation and/or vasodilation) decreased significantly after 4 weeks of electroacupuncture treatment, effects were not maintained during the second 4 weeks of treatment or at 1 or 3 months after treatment.<sup>29</sup>

## Magnets

A single pilot study investigated the use of magnets for hot flash relief.<sup>31</sup> In this small randomized, placebo-controlled, crossover study, 11 breast cancer survivors completed a 24-hour baseline hot flash monitoring session, wore the magnetic or placebo devices for 3 days, completed a post-treatment 24-hour hot flash monitoring session, experienced a 10-day washout period, and then crossed over to the opposite study arm. Magnetic devices (Magna Bloc; Robert Holcomb, MD, PhD, Nashville, TN) and placebos were placed over 6 acupressure sites that are used in the treatment of hot flashes. There is no known mechanism of action for magnet therapies for the treatment of hot flashes. Magnetic therapy was no more effective than placebo in decreasing hot flash severity and, contrary to expectations, placebo was significantly more effective than magnets in decreasing objective measures of hot flash frequency (e.g., sternal skin conductance) and subjective hot flash distress (e.g., self-reported measures of distress). Whether improvement was related to a placebo effect or naturally occurring variation in objective hot flashes throughout the study period is unknown. In addition, the treatment and placebo devices were not completely benign: 55% of participants experienced itching and/or skin reactions due to the adhesive used to affix the magnetic and placebo devices to the skin.

## Reflexology

A single small, randomized study compared the use of foot reflexology ( $n = 35$ ) to a predefined routine of foot massage with no reflexology ( $n = 31$ ).<sup>32</sup> Women reporting menopausal symptoms were randomized to receive reflexology or foot massage given in 6 weekly 45-minute sessions, followed by 3 monthly 45-minute sessions, for a total of 9 sessions. No untoward reactions were noted, although no specific assessment strategies for assessing negative side effects were discussed. Results showed foot reflexology was

no more effective than foot massage in reducing hot flash frequency, severity, or other menopausal symptoms (e.g., memory or concentration problems, sexuality) or improving menopausal quality of life. Outcomes in both groups improved over time. Although the use of foot massage may appear to be a plausible placebo condition, the majority of women in the treatment group and almost half the women in the comparison group were able to correctly identify the condition to which they had been randomized. In addition, no mechanism of action for using this therapy was described.

## Homeopathy

Results of 2 uncontrolled, open-label studies suggested that individualized homeopathic treatments for hot flashes may be effective.<sup>33,34</sup> Clover and Ratsey<sup>33</sup> provided homeopathic treatment to 31 women, 20 of whom were breast cancer survivors. Hot flashes were measured (1) at baseline as the recalled average frequency during the past month and recalled average severity during the past month using a 3-point rating scale (slight, moderate, severe), and (2) at the end of an unspecified treatment period as average recalled frequency and severity during the treatment period. Treatment was associated with a 48% to 75% decrease in subjective hot flash frequency and 53% to 73% decrease in subjective hot flash severity. Similarly, Thompson and Reilly<sup>34</sup> provided individualized consultation and treatment to 45 survivors of breast cancer with improvement seen in all symptoms over time. Limitations were that neither study proposed a mechanism of action, provided specific details regarding homeopathic treatment type or dose, or discussed side effects or negative reactions.<sup>33,34</sup>

## Summary

This review suggests that there is some evidence to continue to investigate acupuncture and homeopathy as potential treatments for hot flashes and other menopausal symptoms. However, insufficient evidence of efficacy exists to support use of the other modalities reviewed here for menopausal symptom management. Careful assessment, documentation, and reporting of possible negative psychological and/or physical reactions are essential to empirically establish the safety of these CAM modalities. However, possible negative physical and/or psychological reactions often were not assessed or reported in the studies reviewed here. In general, investigators appeared to assume either that the CAM modalities were completely benign or that if any negative reactions occurred, they would be spontaneously reported by patients.

An important finding was the paucity of scientific information on the CAM modalities included in this review. Although multiple acupuncture studies were identified, they were difficult to compare. Studies used different samples,

different designs, different types and techniques of acupuncture, and different outcome measures. Thus, these studies did not emerge as a cohesive whole, but rather as 1 or 2 studies on a given treatment modality. Similarly, magnets, reflexology, and homeopathy were represented by only 1 or 2 studies per intervention.

Further studies of the mechanisms of action are needed for the various CAM modalities reviewed here. Few studies in this review addressed mechanism of action; most did not.<sup>27,28,31-34</sup> Of those that addressed mechanism of action, 2 did not directly test it,<sup>23,25</sup> and of the 2 studies that did test it, the mechanism of action was not fully supported by data.<sup>24,29</sup> Although speculating about how these treatments may work is difficult in part because of our lack of understanding of hot flash physiology,<sup>35,36</sup> without some indication of the mechanism of action of treatment, it can be difficult for investigators to adequately design studies and select intervening and outcome variables to test effectiveness.

In addition, the literature is noticeably lacking in information about optimal doses or durations of treatment for the various CAM therapeutic modalities. In these studies, dosages and follow-up periods selected were based on unknown factors and may not have fully allowed treatment effects to emerge.

Important sampling limitations were seen across studies. Small sample sizes may have compromised the power needed to detect group differences. Small sample sizes are especially problematic in studies that anticipate small effect sizes. Sample heterogeneity also presents problems in the group of studies reviewed. Although 4 studies included small samples of women with breast cancer (N = 11 to 45),<sup>27,31,33,34</sup> a population known to suffer more frequent, severe, and bothersome hot flashes than do age-matched healthy women,<sup>9</sup> only 1 study included men with prostate cancer experiencing hot flashes as a result of androgen-deprivation therapy (n = 6).<sup>25</sup> Because these CAM modalities may be less effective when hot flashes are severe and bothersome, such as in survivors of breast cancer, or when tested in men, additional testing in more diverse populations may be warranted.

In addition, outcomes measures generally did not allow the perceived impact of the CAM intervention to be differentiated from the physiologic impact. For example, in 10 of the 11 studies, hot flash frequency was measured only subjectively using self-reports without objective measurement via sternal skin conductance monitoring.<sup>23-29,32-34</sup> Women may report fewer hot flashes over time in the absence of physiologic change due to intervention expectancy effects, memory recall biases, and/or personal characteristics such as mood.<sup>37-41</sup>

Overall, the empiric base for the range of treatments addressed here is limited, due to small sample sizes, short treatment times, compromised designs, and weak measures of critical outcomes. Understanding whether, for whom, and

how these interventions work or do not work requires improved methodologies and a stronger evidence base.

## References

1. US Bureau of the Census. *Population Projections of the United States by Age, Sex, Race, and Hispanic Origin: 1995–2050*. Washington, DC: Population Division, US Bureau of the Census; 1996. Current Population Reports Series No. P25-1130.
2. Cauley JA, Robbins J, Chen Z, et al. Effects of estrogen plus progestin on risk of fracture and bone mineral density: the Women's Health Initiative randomized trial. *JAMA*. 2003;290:1729–1738.
3. Chlebowski RT, Hendrix SL, Langer RD, et al. Influence of estrogen plus progestin on breast cancer and mammography in healthy postmenopausal women: the Women's Health Initiative randomized trial. *JAMA*. 2003;289:3243–3253.
4. Chlebowski RT, Wactawski-Wende J, Ritenbaugh C, et al, for the Women's Health Initiative Investigators. Estrogen plus progestin and colorectal cancer in postmenopausal women. *N Engl J Med*. 2004;350:991–1004.
5. Cushman M, Kuller LH, Prentice R, et al. Estrogen plus progestin and risk of venous thrombosis. *JAMA*. 2004;292:1573–1580.
6. Manson JE, Hsia J, Johnson KC, et al. Estrogen plus progestin and the risk of coronary heart disease. *N Engl J Med*. 2003;349:523–534.
7. Rossouw JE, Anderson GL, Prentice RL, et al. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: principal results from the Women's Health Initiative randomized controlled trial. *JAMA*. 2002;288:321–333.
8. Shumaker SA, Legault C, Rapp SR, et al. Estrogen plus progestin and the incidence of dementia and mild cognitive impairment in postmenopausal women: the Women's Health Initiative Memory Study: a randomized controlled trial. *JAMA*. 2003;289:2651–2662.
9. Carpenter JS, Johnson D, Wagner L, Andrykowski M. Hot flashes and related outcomes in breast cancer survivors and matched comparison women. *Oncol Nurs Forum*. 2002;29:E16–E25.
10. Harris PF, Remington PL, Trentham-Dietz A, Allen CI, Newcomb PA. Prevalence and treatment of menopausal symptoms among breast cancer survivors. *J Pain Symptom Manage*. 2002;23:501–509.
11. Lo Presti A, Ruvolo G, Gancitano RA, Cittadini E. Ovarian function following radiation and chemotherapy for cancer. *Eur J Obstet Gynecol Reprod Biol*. 2004;113(suppl 1):S33–S40.
12. Moyad MA. Complementary/alternative therapies for reducing hot flashes in prostate cancer patients: reevaluating the existing indirect data from studies of breast cancer and postmenopausal women. *Urology*. 2002;59(suppl 1):20–33.
13. Gardner C. Ease through menopause with homeopathic and herbal medicine. *J Perianesth Nurs*. 1999;14:139–143.
14. Hammar M, Nedstrand E, Wyon Y. Few alternatives to estrogen replacement therapy for vegetative symptoms after menopause [Swedish]. *Lakartidningen*. 2004;101:1612–1616.
15. Kass-Annese B. Alternative therapies for menopause. *Clin Obstet Gynecol*. 2000;43:162–183.
16. Katz T. Homeopathic treatment during the menopause. *Complement Ther Nurs Midwifery*. 1997;3:46–50.
17. Thompson EA. Homeopathy and the menopause. *J Br Menopause Soc*. 2002;8:151–154.
18. Barnes PM, Powell-Griner E, McFann K, Nahin RL, for the National Center for Complementary and Alternative Medicine, National Institutes of Health. Complementary and alternative use among adults: United States, 2002. *Advance Data From Vital and Health Statistics, No. 343*. Hyattsville, MD: National Center for Health Statistics, 2004.
19. Newton KM, Buist DS, Keenan NL, Anderson LA, LaCroix AZ. Use of alternative therapies for menopause symptoms: results of a population-based survey. *Obstet Gynecol*. 2002;100:18–25.
20. Kronenberg F, Fugh-Berman A. Complementary and alternative medicine for menopausal symptoms: a review of randomized, controlled trials. *Ann Intern Med*. 2002;137:805–813.
21. Seidl MM, Stewart DE. Alternative treatments for menopausal symptoms: systematic review of scientific and lay literature. *Can Fam Physician*. 1998;44:1299–1308.
22. North American Menopause Society. Treatment of menopause-associated vasomotor symptoms: position statement of the North American Menopause Society. *Menopause*. 2004;11:11–33.
23. Cohen SM, Rousseau ME, Carey BL. Can acupuncture ease the symptoms of menopause? *Holist Nurs Pract*. 2003;17:295–299.
24. Dong H, Ludicke F, Comte I, Campana A, Graff P, Bischof P. An exploratory pilot study of acupuncture on the quality of life and reproductive hormone secretion in menopausal women. *J Altern Complement Med*. 2001;7:651–658.
25. Hammar M, Frisk J, Grimas O, Hook M, Spetz AC, Wyon Y. Acupuncture treatment of vasomotor symptoms in men with prostatic carcinoma: a pilot study. *J Urol*. 1999;161:853–856.
26. Ping J, Ren-hai M, Zhong-xiang W. Body acupuncture plus ear pressing in the treatment of menopausal syndrome. *Int J Clin Acupuncture*. 1998;9:471–473.
27. Porzio G, Trapasso T, Martelli S, et al. Acupuncture in the treatment of menopause-related symptoms in women taking tamoxifen. *Tumori*. 2002;88:128–130.
28. Sandberg M, Wijma K, Wyon Y, Nedstrand E, Hammar M. Effects of electro-acupuncture on psychological distress in postmenopausal women. *Complement Ther Med*. 2002;10:161–169.
29. Wyon Y, Lindgren R, Lundeberg T, Hammar M. Effects of acupuncture on climacteric vasomotor symptoms, quality of life, and urinary excretion of neuropeptides among postmenopausal women. *Menopause*. 1995;2:3–12.
30. Wyon Y, Wijma K, Nedstrand E, Hammar M. A comparison of acupuncture and oral estradiol treatment of vasomotor symptoms in postmenopausal women. *Climacteric*. 2004;7:153–164.
31. Carpenter JS, Wells N, Lambert B, et al. A pilot study of magnetic therapy for hot flashes after breast cancer. *Cancer Nurs*. 2002;25:104–109.
32. Williamson J, White A, Hart A, Ernst E. Randomised controlled trial of reflexology for menopausal symptoms. *Br J Obstet Gynaecol*. 2002;109:1050–1055.
33. Clover A, Ratsey D. Homeopathic treatment of hot flashes: a pilot study. *Homeopathy*. 2002;91:75–79.
34. Thompson EA, Reilly D. The homeopathic approach to the treatment of symptoms of oestrogen withdrawal in breast cancer patients: a prospective observational study. *Homeopathy*. 2003;92:131–134.
35. Freedman RR. Menopausal hot flashes. In: Lobo RA, Kelsey J, Marcus R, eds. *Menopause: Biology and Pathobiology*. San Diego: Academic Press; 2000:215–227.
36. Freedman RR. Hot flashes revisited. *Menopause*. 2000;7:3–4.
37. Pedhazur EJ, Schmelkin L. *Measurement Design, and Analysis: An Integrated Approach*. Hillsdale, NJ: Lawrence Erlbaum; 1991.
38. Carpenter JS, Monahan PO, Azzouz F. Accuracy of subjective hot flush reports compared with continuous sternal skin conductance monitoring. *Obstet Gynecol*. 2004;104:1322–1326.
39. Carpenter JS, Andrykowski MA, Freedman RR, Munn R. Feasibility and psychometrics of an ambulatory hot flash monitoring device. *Menopause*. 1999;6:209–215.
40. Freedman RR. Laboratory and ambulatory monitoring of menopausal hot flashes. *Psychophysiology*. 1989;26:573–579.
41. Carpenter JS, Azzouz F, Monahan PO, Storniolo AM, Ridner SH. Is sternal skin conductance monitoring a valid measure of hot flash intensity and/or hot flash distress? *Menopause*. 2005;12:512–519.