

11-20-2009

Registered Dietitian Interest in Complementary Medicine

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Abstract

Complementary and alternative medicine (CAM) has become very popular with populations internationally and in the United States. CAM is defined as “a group of diverse medical and health systems, practices and products that are not generally considered as part of conventional medicine”. CAM is described as having five specific divisions: whole medical systems, mind-body medicine, biologically-based practices, manipulative- or body-based practices, and energy medicine.

Recent studies have shown that CAM use is increasing. In the US 33% of the population reported using CAM in 1990, but 1997 usage rates increased to over 41%. The popularity of CAM is one of the reasons for the creation of the National Center for Complementary and Alternative Medicine (NCCAM) by the National Institutes of Health the Federal Government's lead agency for scientific research on the diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine”. NCCAM information was the foundation for this project.

The goals of this project are to evaluate the interest of dietitians in Georgia in CAM and introduce participants of this project to a segment of CAM treatments. The primary research question is: Are dietitians in the state of Georgia interested in using CAM as part of their practice? There were three distinct portions to this project; the initial survey of the dietitian participants, the development and use of the introductory CAM lesson, and the evaluation of this lesson and final survey. The data from both the first and second surveys as well as the post test does support a positive answer to the research question, “Are registered dietitians in the state of Georgia interested in CAM? The results clearly indicate an interest from both the survey 1 and survey 2/ post test group.

Some may ask, “Is this really of any importance to the dietetics profession?” The answer to this can be found in the nutrition literature. Conducting a topic search of “Complementary and alternative medicine” in three predominant nutrition journals: the American Journal of Clinical Nutrition, The Journal of Nutrition and The Journal of the American Dietetic Association, revealed more than 17,000 articles. These articles range for original research to review of original research to commentary articles evaluating the use of CAM to the dietetics practice. A number of articles addressed the importance of CAM in dietetics education as well as its importance to the practice and reimbursement for services.

College of Health & Human Sciences

Georgia State University
Graduate Program in Health Sciences

REGISTERED DIETITIAN INTEREST IN COMPLEMENTARY AND ALTERNATIVE
MEDICINE

By

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B.A., Berea College, 1989

B.S., Eastern Kentucky University 1999

A Thesis Submitted to the Graduate Committee

In the Division of Nutrition at Georgia State University in Partial Fulfillment

Of the

Requirements for the Degree

MASTERS OF SCIENCE

ATLANTA, GEORGIA

2009

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Acknowledgements

I owe my deepest gratitude to Dr. Mildred Cody, without whom I would not have pursued my master's degree. Thank you for your time, your energy and the care that you took with me every step of the way.

I am also grateful to the members of my committee; Dr. Murugi Ndirangu, Dr. Tai Wang and Professor Susan Roman. If it were not for your support and guidance this thesis would not have been possible.

I would like to thank the Georgia Dietetic Association and the Greater Atlanta Dietetic Association for aiding in publicizing the various sections of this thesis. Thank you for getting the word out to the dietitians of our state.

I would also like to thank Senior Connections, my place of employment, for allowing a flexible schedule during the process of my education. I also thank Senior Connections for all the moral support over the last two years.

Finally, I would like to thank my friends and family, in particular my husband Chris Johnson. I cannot express what your loving patience and support have meant during this process.

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List of Abbreviations

1. CAM	Complementary and Alternative Medicine
2. TCM	Traditional Chinese Medicine
3. NCCAM	National Center for Complementary and Alternative Medicine
4. NIH	National Institutes of Health
5. DSHEA	Federal Dietary Supplement Health Education Act
6. CVD	Cardiovascular Disease
7. TM	Transcendental Meditation
8. NO	Nitric Oxide
9. IBS	Irritable Bowel Syndrome
10. IBD	Inflammatory Bowel Disease
11. TXYF	Ton Xie Yao-Fang (herb used in TCM)
12. GAIT	Glucosamine/Chondroitin Arthritis Intervention Trial
13. CEU	Continuing Education Unit
14. GDA	Georgia Dietetic Association
15. GADA	Greater Atlanta Dietetic Association
16. AJCN	American Journal of Clinical Nutrition
17. JN	Journal of Nutrition
18. JADA	Journal of the American Dietetic Association
19. ADA	American Dietetic Association
20. MNT	Medical Nutrition Therapy

Chapter I: Introduction

Complementary and alternative medicine (CAM) has become very popular with populations internationally and in the United States. CAM is defined as “a group of diverse medical and health systems, practices and products that are not generally considered as part of conventional medicine” (1). CAM is described as having five specific divisions: whole medical systems, mind-body medicine, biologically-based practices, manipulative- or body-based practices, and energy medicine. Whole medical systems are those outside of conventional medicine that are based on a complete philosophy and practice. These include; Ayurveda, an ancient Indian tradition; Traditional Chinese Medicine (TCM); Homeopathy and Naturopathy. Mind-body medicine is a group of treatments or practices designed to connect the mind, body and spirit. These practices include meditation, prayer and other healing techniques such as yoga (from Indian tradition) or Tai Chi (From TCM). Biologically-based practices are those that include herbal supplements or special diet treatments. Manipulative practices are those such as chiropractic or massage therapy where physical manipulation of the body is used as a means of healing. The fifth and final type, energy medicine, is a group of practices that are supposed to influence the energy fields of the body. These include therapeutic touch, reiki and the use of magnets (1).

The popularity of CAM is one of the reasons for the creation of the National Center for Complementary and Alternative Medicine (NCCAM) by the National Institutes of Health. “The National Center for Complementary and Alternative Medicine

(NCCAM) is the Federal Government's lead agency for scientific research on the diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine” (1). This department grew out of the 1992 creation of the Office for Unconventional Medical Processes by NIH (2). Another reason for the creation of this department is the need for quality research for the remedies that the population is using. The Federal Dietary Supplement Health Education Act (DSHEA), the federal regulation of dietary supplements, allows for the sales of these supplements without the same rigorous testing that is required for medicines (2). This opens CAM use up to the public at their own risk, placing the responsibility on the public to learn about the therapies they choose. CAM use has become so prevalent that it is now estimated that by 2010 two-thirds of the US population will use some type of CAM therapy (3). Given this increase in use, it makes sense that members of the health care team will need to increase their knowledge of these treatments and practices.

The goals of this project are to evaluate the interest of dietitians in Georgia in CAM and introduce participants of this project to a segment of CAM treatments. The primary research question is: Are dietitians in the state of Georgia interested in using CAM as part of their practice? As an initiating portion of the project, participating dietitians will complete an online survey to help choose the topic for the introductory CAM lesson. This survey will also begin to help answer the above-stated question and describe the demographics of the participant population. The lesson will provide an overview of CAM treatments for a specific condition, articles to read and use as continuing education credit, and a glossary.

Chapter II: Review of Literature

CAM Utilization

Recent studies have shown that CAM use is increasing. In the US 33% of the population reported using CAM in 1990, but 1997 usage rates increased to over 41% (4). Those who are in their 50's are the group most likely to access CAM treatments. This usage appears to drop over time, but it still remains at 24.2% of the population even in the 8th decade of life. CAM users are more likely to be female than male, are more likely to be well educated and are more likely to live in the Western part of the country. This does not mean that the Eastern United states does not have CAM usage; it has just been slower to develop (3).

The types of treatments that are being accessed have changed over time. In 2002 the most popular treatments were echinacea, ginseng, ginkgo biloba, and garlic supplements. By 2007 the top CAM treatments were fish oil or omega-3 fatty acid supplements, glucosamine, echinacea, flax seed oil pills and ginseng. These changes in treatment echo the changes in conditions being treated, the treatment of cholesterol replacing treatment of colds in the top five. Those surveyed in 2002 reported treating back pain, head or chest cold, neck pain, joint pain or arthritis and anxiety or depression. By 2007 the top conditions being treated by CAM users were back pain, neck pain, joint pain or arthritis, anxiety and elevated cholesterol (3). A review of literature available on Pub Med using search criteria such as; CAM, complementary medicine, alternative

medicine, traditional medicine, herbal medicine, ayurveda, and traditional Chinese medicine revealed several areas of research interest. These included; obesity, menopause, gastrointestinal issues, cardiovascular diseases, chronic pain and inflammatory conditions such as arthritis, areas of interest to the student researcher and possibly to participating dietitians.

CAM Treatment for Obesity

CAM treatments and practices are used for a wide range of conditions. Obesity, a frequent concern for Americans, is treated by many different practices from herbal supplements to hypnosis. A recent study found that 36% of the 31,044 adults surveyed during 2002 had used CAM therapies for weight loss during the earlier year (5). Researched treatments for obesity include; herbal supplements, yoga or other movement or exercise type treatment, massage, meditation, acupuncture and others. Two herbal treatments common to Traditional Chinese Medicine (TCM) have recently been studied with seemingly positive results. Nelumbo nuciferal leaves, commonly used in TCM, were given to mice that were obese due to excess consumption of a high fat diet. This particular investigation found that the herbal treatment interrupted the absorption of some of the ingested carbohydrate and fat in the small intestine. While safety of use was not established, it did establish effectiveness of this particular plant therapy (6). A combination of white mulberry, lemon balm and injin leaves (TCM herbal weight treatment) was also investigated for use in “obesity regulation.” This set of researchers found that the herbal treatment helped to regulate obesity and lipid distribution. This effect is believed to be due to the treatment’s ability to increase expression of PPAR alpha, possibly increasing beta-oxidation of fats (7). Other CAM therapies that have

been studied include; pyruvate supplementation, yerba mate, topical creams and many more (8, 9). Popular weight loss treatments such as hoodia and bitter orange have met little success when researched. Hoodia research has shown little if any effect (10). Bitter orange was shown to increase heart rate and was associated with heart attack and stroke and is not recommended (11).

CAM Treatment for Menopause

Menopause is another condition or stage of life for which CAM therapy is frequently accessed. This makes sense given the high reported use of CAM by women. Typical treatments for menopausal symptoms include: acupuncture, wild yam creams, black cohosh, red clover leaf, soy preparations and many more. Soy and other phytoestrogens have been researched extensively. In their randomized controlled study Han and colleagues found that a dose of 100 mg daily of soy isoflavones decreased symptoms commonly associated with menopause, both vasomotor (hot flashes) and the more subjective symptoms such as nervousness and melancholia. Researchers suggest that this effect is due to the phytoestrogens binding to estrogen receptor sites and mimicking a condition of higher estrogen levels (12). Black cohosh is one of the most popular CAM treatments of this type. This herbal supplement contains formononetin, an estrogen-like isoflavone. Research results have been varied, but it does appear that this particular treatment is safe (13). Red clover leaf is another frequently used herbal supplement. Despite its popularity, there is very little to support its use for menopausal symptoms (14, 15). The consensus report from the National Institutes of Health reminds us that research is very young for these types of treatment and that much more is needed (15).

CAM Treatments for Cardiovascular Disease

CAM treatments are also used for cardiovascular disease (CVD). In 2000 a workshop of researchers sponsored by NCCAM and the National Heart Lung Blood Institute (NHLBI) was convened to discuss research of CAM treatments for cardiovascular, lung and blood conditions. They looked at several treatments that have been reported effective for CVD including ginseng, garlic, ginkgo, transcendental meditation (TM), and acupuncture. Garlic has been shown in observational studies to be effective in treating heart disease, but randomized controlled studies have not yet shown these same results. One explanation for this may be low concentrations of allicin (the active component in garlic) present in many of the over-the-counter products (16). Gardner and colleagues found similar issues when they examined the effect of raw garlic and over-the-counter garlic supplements for their cholesterol-lowering abilities in humans. They found no serious side effects from the use of garlic beyond bad breath and stomach upset, but they also found no statistically significant evidence for its use in lowering serum cholesterol levels. They did note that previous studies that had shown benefit used much higher doses of garlic and suggest that research is needed to standardize both the dose and the delivery system of the product (17). Caution should be taken with garlic supplements if the patient has a bleeding disorder or is planning surgery because it reduces the blood's ability to clot (18).

Ginkgo is a common treatment of vascular insufficiency in European nations. A possible mechanism for this is platelet aggregation or even an antioxidant effect of the

herb. It has also been shown that ginkgo increases levels of nitric oxide (NO) in the endothelium. It is not yet clear if this vascular protective effect is due to decreased NO breakdown or by increased production (16).

Another herbal treatment commonly used for CVD is hawthorn. The leaf or flowers of the English hawthorn are used to make extracts, or it can be taken in capsule form. Hawthorn has been used for the treatment of heart failure, heart weakness, and angina. There is little evidence at this point supporting such use. NCCAM is currently supporting research to investigate the mechanisms that hawthorn may impact the heart and heart failure (19).

Acupuncture, a treatment that is seen in use for many other health concerns, has been explored for CVD as well. This treatment involves the placement of needles at specific points across the body with the goal of balancing the life force energy or Chi and the two opposing universal forces, yin and yang, within the body. Zang-Hee Cho has examined “positron emission tomography and functional MRI” (29) to establish the neural impact of acupuncture. This research has shown “changes in blood flow and oxygenation of certain brain regions” (16). Peng Li’s work showed the impact on blood pressure of electroacupuncture. This research showed “that low-frequency electroacupuncture activates opioid receptors and provides a therapeutic effect on hypertension (16).”

Another researched treatment for CVD is transcendental meditation (TM), a mind-body medicine practice. A study conducted by Schneider and colleagues looked at stress relief for African-American patients with hypertension. Their results showed a

significant reduction in blood pressure. They were also able to show that the treatment was culturally acceptable and had high compliance rates (16). Utilizing mind-body treatments may be a low cost method of treating CVD. The next stages in research will be interesting to observe.

CAM Treatment for Irritable Bowel Syndrome

Irritable bowel syndrome (IBS) is a condition affecting 15- 20% of the US population. It is the combination of a group of symptoms; diarrhea, constipation or a cycle of diarrhea and constipation, abdominal pain. There appear to be no physical changes to gastrointestinal structures (20). CAM treatment use is common for people with IBS and other types of inflammatory bowel disease (IBD) such as ulcerative colitis, Crohn's disease and others. A utilization study in Germany found that 52% of patients surveyed used CAM at some point for treatment of IBS or IBD. The most popular treatments included homeopathy, probiotics, naturopathy, TCM, and Boswellia (21).

Boswellia or boswellia serrata is an Ayurvedic herbal treatment also known as frankincense. The active component in boswellia is boswellic acid. In a small, short-term study researchers found that 900 mg of the resin of boswellia given daily in 300 mg doses decreased symptoms. This study indicated that it may be even more effective than sulfasalazine (a sulfa drug used to treat IBD). The study was only 6 weeks long and did not evaluate implications of long term dosages (22).

TCM is frequently used, as mentioned above. Ton Xie Yao-Fang (TXYF) is a traditional Chinese herbal treatment for IBS. It is made of 4 different herbs common to China; rhizome atractylodis macrocephalae, radix paeoniae alba, pericarpium citri

reticulatae and radix saposnikoviae. Bian and colleagues conducted a systematic review of literature focusing on randomized controlled studies. They found that there is evidence indicating possible effectiveness of TXYF for IBS. The research is, however, inconsistent and small in scope. A randomized, placebo-controlled trial conducted by Leung and colleagues examined the use of TCM treatments for IBS using TCM criteria for treatment. They examined a version of TXYF that contained 11 herbs. The four herbs listed above were part of this mixture, but there were 6 additional; astragalus membranaceus, bupleurum chinense, murraya paniculata, punica grantum, and portulaca oleracea. They did find a reduction of symptoms but not across all the patients with statistical significance. The researchers believe that there may be subgroups of IBS patients for whom different formulation could be used for variations in symptoms (23). Additional research is needed with larger populations of each subgroup to begin to test this belief.

CAM Treatments for Chronic Pain and Inflammatory Conditions

Many of the treatments used for inflammatory conditions were used to treat the pain of the underlying condition. For this reason these two categories have been combined. Cat's claw is a traditional treatment for inflammatory conditions such as arthritis pain that has been used by the indigenous peoples of Central and South America for centuries. Its active compounds are quivonic acid glycosides, polyhydroxylated triterpenes and alkaloids which reportedly decrease tumor necrosis factor alpha gene expression, and this decreases inflammation and pain for the individual (24). In a 2001 research article Sandoval and colleagues report that the use of cat's claw in a clinical setting showed significant benefit. They showed that the cat's claw group had a

significant reduction in pain as compared to the control group during physical activity. This effect did not carry over into pain at rest for any of the groups (25). While not decreasing at-rest pain, this treatment shows interesting application possibilities for those who have limited physical activity due to arthritis pain.

Acupuncture, already mentioned in the treatment of CVD is also widely used for the treatment of pain and inflammatory conditions such as arthritis (24). Hockberg and colleagues conducted a randomized and controlled trial investigating acupuncture as an adjunctive therapy for arthritis pain. They discovered that, over a 26-week trial, by week 14 those in the acupuncture group had a 40% reduction in pain as compared with the education-only control group. This effect held even after controlling for conventional pain and inflammation mediations being taken by the participants. This study opens the door for collaboration between CAM and conventional arthritis and pain treatments (26).

Glucosamine and chondroitin, either together or taken separately, are some of the most popular CAM treatments for arthritis. They are reported to decrease damage to the joint itself and thus decrease pain and loss of function (24). Clegg and colleagues as part of the GAIT trial, Glucosamine/Chondroitin Arthritis Intervention Trial, sponsored by NCCAM, looked at the effectiveness of glucosamine, chondroitin alone and in combination as compared to a placebo and the conventional medication Celebrex™. They found that, for those with mild to moderate arthritis pain, glucosamine, chondroitin alone or in combination were not significantly more effective than the placebo or the conventional medication. They did find, however, that, in a subgroup of those with moderate to severe arthritis pain, these CAM treatments could be effective (27, 28).

While there are many studies in existence about CAM treatments, more are needed show the treatments usefulness or lack thereof. Criticisms of existing studies include inconsistency across studies, inconsistency of treatment methodologies, inadequate population sizes, and insufficient time for treatment and follow up and so on. We see from NCCAM utilization data that lay use of CAM is increasing, and this necessitates an increase in quality research and in the number of practitioners who are prepared to educate the general public about CAM and conventional medical usage, both its potential benefits and its limitations.

Chapter III: Methods

This project had three distinct parts; the initial survey of the dietitian participants, the development and use of the introductory CAM lesson, and the evaluation of this lesson and final survey. The first survey was used to collect demographic data, CAM interest and utilization data and professional practice data from the participating dietitians. The initial survey will also allow participating dietitians to choose the subject matter for the introductory CAM lesson from a selection of six topics. Those topics include CAM treatments for weight loss/obesity, menopause, cardiovascular disease, gastrointestinal diseases such as irritable bowel syndrome, chronic pain; and inflammatory conditions such as arthritis.

An online survey tool, Survey Monkey, was used to deliver the initial and post surveys and to collect the post test data. Data from the surveys and post test analyzed using the services provided by Survey Monkey as well as SPSS 16.0 software for statistical analysis. The initial group of participants was 52 in number. Sixteen participants completed the post test following the CEU lesson and 15 people completed the post lesson survey.

The sample used was one of convenience. The project and materials were advertised by the Georgia Dietetic Association and the Greater Atlanta Dietetic Association via email updates. Despite this publicity the greatest number of responses occurred following a personal request to participate by the student researcher and the faculty advisor. For this reason the sample was not a randomized sample.

The lesson and information about the surveys were posted at www.eatbreathebewell.com, a website developed by the student researcher. The website was also used to post the final manuscript so that the participants could access it. The lesson was developed after the first survey was completed. The topic chosen was inflammatory conditions such as arthritis. The participants in the initial survey indicated a desire for there to be between 1 and 5 hours of continuing education credit dictating the length of the CEU lesson that was developed. Finally the participants in the first survey requested that a reference chart that accompanies the introductory chapter resulting in the materials developed.

Chapter IV: Results

Participant Characteristics

There were differences between the participant samples for each of the two surveys. Both groups were predominantly female and practiced in an urban setting (see Table 1). Those participating in the first survey tended to have more years in practice, 29 percent having practiced for 21 years or more. The majority of the second survey participants had been in practice for a year or less (30%) followed by participants with 11-20 years of practice (27%).

Table 1

Survey1								Survey2							
Years in Practice		Practice Setting		Sex		Age		Years In Practice		Practice Setting		Sex		Age	
0-1	21%	Urban	71%	Male	6%	20s	29%	0-1	33%	Urban	57%	Male	13%	20s	20%
2-5	23%	Suburban	25%	Female	94%	30s	33%	2-5	20%	Suburban	36%	Female	87%	30s	20%
6-10	23%	Rural	4%			40s	11%	6-10	20%	Rural	7%			40s	40%
11-20	4%					50s	15%	11-20	27%					50s	20%
21+	29%					60s	8%	20+	0					60s	0
						70s	2%							70s	0
						80s+	0							80s+	0

Survey Participant Demographics Survey 1 had 52 participants and Survey 2 had 15 participants

There are differences in the practice types between the two survey groups (see Table 2). The survey 1 participants tended to work in clinical practice or the other category. For this group the other category included journalism, education, student, school nutrition

m management, wellness and food service. The survey 2 participants tended to work in private practice or in community settings.

Table 2

Survey1				Survey2							
Practice Setting		Employed Outside Home		Area Of Practice		Practice Setting		Employed Outside Home		Area of Practice	
Urban	71%	No	14%	Clinical	31%	Urban	57%	No	13%	Clinical	21%
Suburban	25%	Part Time	15%	Outpatient	13%	Suburban	36%	Part Time	13%	Outpatient	7%
Rural	4%	Full Time	71%	Community	13%	Rural	7%	Full Time	74%	Community	29%
				Private Practice	8%					Private Practice	29%
				Other	35%					Other	14%

Survey Participant Practice Information (The other category in area of practice includes journalism, education, student, school nutrition m management, wellness and food service for survey 1. This category only includes food service for survey 2.)

Interest in CAM for Professional Practice or for Personal Use

Participants in survey 1 indicated an interest in CAM, 46 of the 52 responding yes (88.5 %). Yet only 10 of the 52 or 20.4 percent indicated that they interested in CAM for professional practice (see Table 3). The “other” category includes the interest of 4 participants in all three options; professional use, personal use, and how clients might be using CAM. The interest in CAM for personal use was indicated by 19 of the 52 respondents or 38.8 percent. Those indicating that they are currently using CAM were only 18.4 percent or 9 respondents.

Participants in survey 2 and the post test also indicated an interest in CAM. When asked if they would use CAM in their professional practice given more continuing

education, 56.3 percent answered yes and 31.3 answered maybe. The primary type of information desired in the future was CAM uses.

Table 3

Survey1					
Interested In CAM		Area of Interest		Currently Using CAM for Professional Practice	
Yes	88.5%	Personal	38.8%	Yes	18.4%
No	25%	Professional	20.4%	No	81.6%
Maybe	4%	How Clients are Using	30.6%		
		Not Sure	2%		
		Other	8.2%		

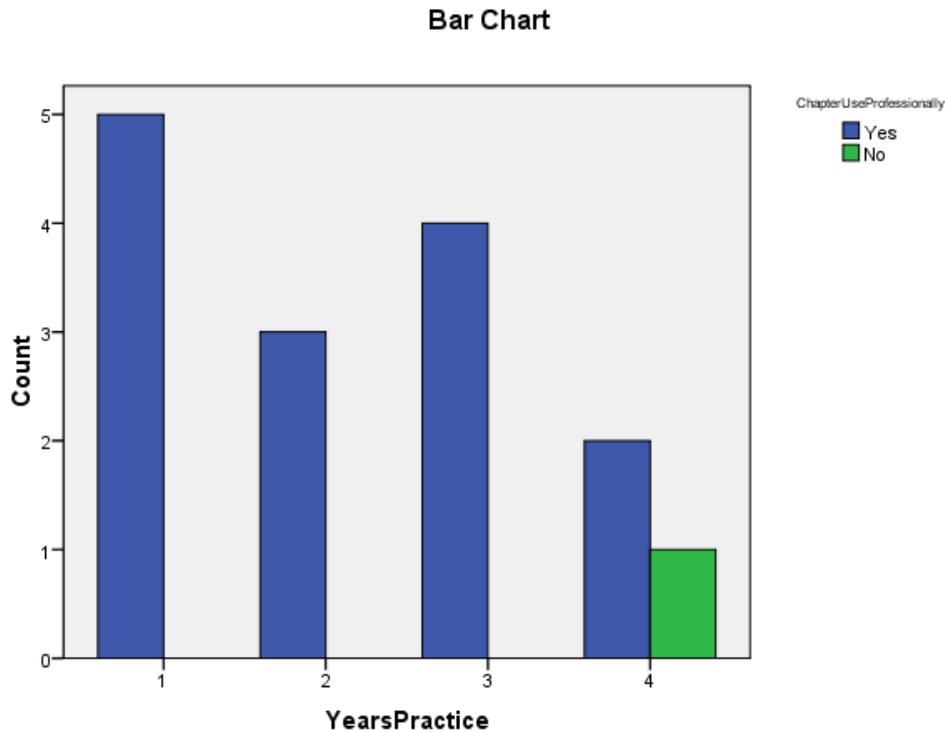
Survey 1 Participant Interest In CAM. In the area of interest "other" indicated both professional and personal interest and client use.

Table 4

Survey2		Post Test		Post Test	
Clients Currently Use CAM		Given more education would be willing to use CAM in practice		Types of CAM Information Interested in Receiving	
Yes	60%	Yes	56.3%	CAM Contraindications	31.3%
No	13.3%	No	12.5%	CAM/Drug Interactions	37.5%
Don't Know	26.7%	Maybe	31.3%	CAM Uses	56.3%
				CAM Utilization in U.S.	12.5%
				Other	6.3%

Survey 2 and Post Test Participant CAM Interest/Use. Other includes CAM safety.

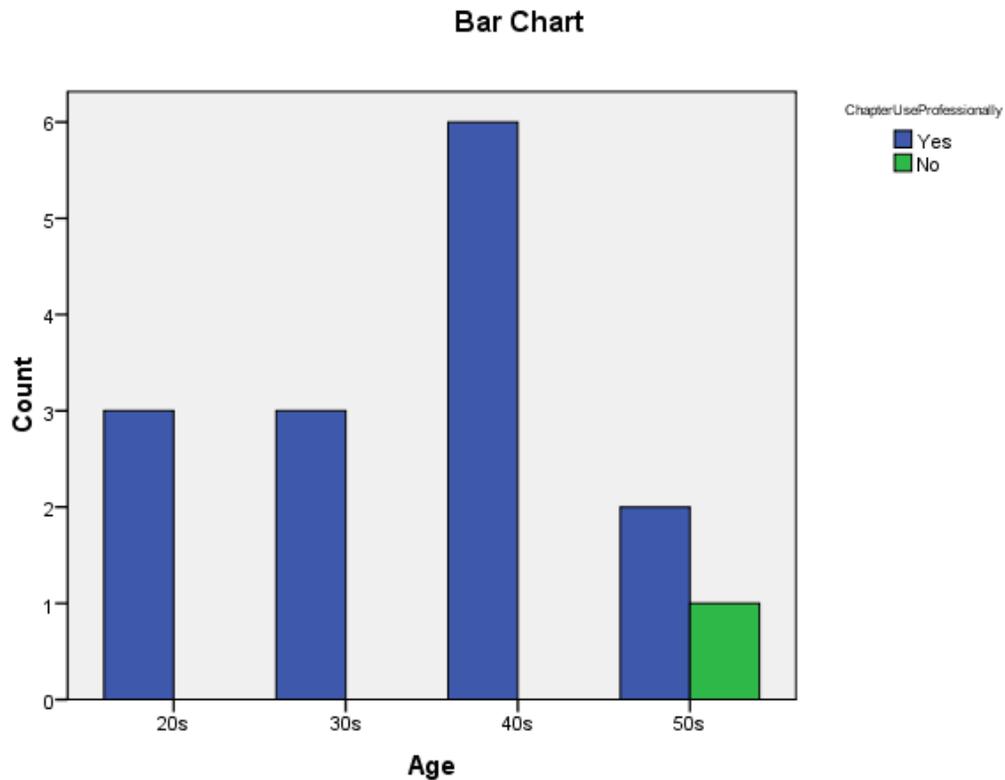
Chart 1



Comparison of survey 2 participants' years of practice and whether or not they found the chapter useful professionally.

Chart 1 shows a comparison of the survey 2 respondents' years of practice with whether or not they found the CEU chapter professionally useful. Those who have been in practice for one year or less accounted for 35.7 percent of participants who found the chapter useful professionally. The next largest group was those in practice for 6-10 years, accounting for 28.6 percent of those answering yes to this question. Those in practice for 11-20 years accounted for 100 percent of the no answers (only 6.7% of the total population) and only 14.3% of those answering yes.

Chart 2



Comparison of survey 2 participants' age and whether or not they found the chapter professionally useful

Chart 2 shows a comparison of survey 2 participants' age and whether or not they found the chapter professionally useful. The largest group, those in their forties, accounts for 42.9 percent of the affirmative responses. The groups in their twenties and thirties account for only 21.4 percent each. As we saw in the chart 2, those farther into their career, those in their fifties account for only 14.3 percent of the affirmative answers and the entire negative answers (6.7% of the population).

Choices for Introductory Chapter

The choice for CEU lesson chapter included CAM use in weight loss, inflammatory conditions like arthritis, menopause, irritable bowel syndrome, cardiovascular disease, and chronic pain. The most frequently chosen topic was inflammatory conditions.

Future Interests for CEU's

To facilitate the development of future CEU lessons, the survey respondents were asked what topics they might be interested in. The choices included; menopause, GI diseases, chronic pain, weight loss and other. The most frequently chosen topic was weight loss with 33.3 percent of respondents. Menopause and GI diseases were second with 26.7 percent choosing and chronic pain and other were picked by 6.7 percent. The other category included CAM safety.

Suggestions for Chapter

To help with the development of this CEU lesson and future endeavors, the respondents of Survey 2 and Post test were asked for suggestions for the chapter after completing the Post test. Eleven of the 15 people completing Survey 2 answered the suggestions question. Their answers were as follow:

Suggestions for Lesson:

1. A variety of topics would be helpful
2. More in-depth about each treatment
3. Don't know
4. I thought it was very useful
5. I would like to see a variety of topics

6. Maybe put the glossary before the article summaries
7. Combine the glossary and chart for 1 simple reference
8. More of this type of info please
9. N/A
10. Greater scope of information
11. N/A

The suggested changes for the lesson listed above were reviewed and incorporated when possible.

Study Limitations

There were limitations with this research project. The number responding to the second section of the project, the lesson, post test and post lesson survey, was quite small. The pool of potential participants exceeded 1000 from those who received This may have been due to the length of the CEU lesson and the time given to complete the lesson, post-test and post lesson survey. This section was released to the study population at the beginning of the 2009 fall term at Georgia State University and remained open for two and a half months. It may be that this period of time is too busy in most work settings and that a longer availability was needed to achieve more statistically significant response numbers. Another limitation was the use of only online surveys. The use of multiple survey tools such as online, phone and hard copy may produce a greater number of responses.

Chapter V: Discussion and Conclusions

The data from both the first and second surveys as well as the post test does support a positive answer to the research question, “Are registered dietitians in the state of Georgia interested in CAM? The results clearly indicate an interest from both the survey 1 and survey 2/ post test group. The survey 1 participants appear to show a more general interest in the topic given that only 19 percent of this original group was interested in CAM for professional practice. Survey 2/post test participants showed a much greater level of professional interest with 56.3 percent willing to incorporate into professional practice. This variance may be due to the difference in stages of professional practice between the two groups. The survey 2 group is split between a first year practice and those who are in the middle of their career. The first year dietitians may have had greater exposure to these ideas during their primary education. The mid career dietitians may be seeing an increase in use of CAM with their clients, while those who are farther along in their career may not be interested in increasing the scope of their practice.

Some may ask, “Is this really of any importance to the dietetics profession?” The answer to this can be found in the nutrition literature. Conducting a topic search of “Complementary and alternative medicine” in three predominant nutrition journals: the American Journal of Clinical Nutrition, The Journal of Nutrition and The Journal of the American Dietetic Association, revealed more than 17,000 articles. A sampling of these topics from AJCN and JN included: safety, use and efficacy, diabetes and use of

chromium, dietary Supplements, immunomodulatory effects of Chinese herbs, menopause micronutrients and hormone therapy, macrobiotic diet and cancer. The Journal of the American Dietetic Association's focus was more practice based. Topics in JADA included: CAM friend or foe, CAM practice guidelines for dietitians, CAM another portal for MNT reimbursement, CAM education not consistent for dietitians. Given the interest of these scholarly journals the answer has to be yes, this is of importance to the dietetics profession.

In his commentary article Albert Barrocas MD makes the point that dietitians have an opportunity with the emergence of CAM practices for the general public. He charges the dietetics profession to keep an open mind, encourage acceptable controlled studies of CAM therapies, not ignore the potential placebo effect, not to accept all therapies as efficacious and to avoid arrogant attitudes toward CAM (29).

In her ADA public policy report Dorothy Michalezyk discusses the importance of CAM as a way to increase Medical Nutrition Therapy (MNT) reimbursement prior to the passage of the MNT Act. During this time insurers were beginning to reimburse for some CAM therapies. A pilot program in 1996, through Oxford Health Plans, initiated an alternative therapy network. This network included such practitioners as; chiropractors, acupuncturists, massage therapists and registered dietitians. One year later included this group of providers as "provider services through a credentialed network of non-physician healthcare providers" (30). This access to provider networks prior to the passage of the MNT Act was a breakthrough. As dietitians continue to struggle with the expansion of MNT service reimbursement these provider networks may be our access to increased MNT reimbursable services.

If the topic of CAM is important to the profession then how do we prepare for this? There are continuing education units on CAM topics available but they are still limited. In their 2006 JADA article Dr. Vickery and colleagues address the inconsistency of the offerings within dietetics programs. Their research shows that the majority of dietetics programs do address CAM therapies in some way. The primary CAM topic that is covered is dietary supplements. These researchers believe that with the increase in consumer use of CAM therapies and need for reliable information that dietitians must become “more informed.” In addition they assert that “a body of scientifically sound knowledge is imparted to students via dietetics curricula” (31).

How should the dietetics profession proceed? There have been several American Dietetic Association (ADA) initiatives dealing with CAM. The dietetic practice group Nutrition and Complementary Care (now called Dietitians in Integrative and Functional Medicine) was developed and there have been official ADA publication on CAM topics such as “Food Fortification, Functional Foods, and Dietary Supplements” (32). ADA also established the CAM task force 2002-2003. This group worked to establish broad competencies around the topic of CAM and more specific competencies around the topic of dietary supplements. The broad competencies for CAM are as follows: (32)

Dietetics professionals should be able to:

- a) *Describe the taxonomy of the five domains of complementary and alternative medicine (CAM) as outlined by the National Institutes of Health’s National Center for CAM (NCCAM).*

- b) *Describe the risks, benefits, philosophies and principles for the most frequently utilized CAM modalities.*
- c) *Articulate general and specific CAM application for wellness and illness*
- d) *Identify cultural diversity, and social-economic factors that influence competency in CAM clinical practice*
- e) *Outline an appropriate holistic approach to patient care including;*
 - a. *Evaluation of diet first as a basis for recommending select CAM modalities*
 - b. *Identification of high-risk groups and key lifestyles and genetic factors to evaluate.*
 - c. *Effective communication with patients, including interviewing, listening, guiding, counseling, documentation and referral.*
 - d. *Documentation of patient use and clinical response to CAM modalities within the context of a nutrition care plan.*
- f) *List techniques to facilitate effective communication between CAM and conventional practitioners.*
- g) *Demonstrate ability to access and assess scientifically sound resources and information.*
- h) *Review critically selected literature and apply the principles of scientific rigor and evidence-based practice to evaluate CAM research.*

- i) *Articulate the legal, ethical and clinical practice issues, including scopes of practice.*
- j) *Outline a process that integrates CAM and conventional approaches in practice and or research.*

Based on the results of this exploratory research, there is interest among the dietitian in Georgia who responded to the surveys in this project. More research is needed to discern the level of CAM education needed and desired by current and future dietitians. The ADA CAM taskforce competencies for CAM seem to make a useable outline for an introductory class to be included in the core curriculum. It may be advisable to include versions of this class in both the undergraduate and graduate dietetics programs. The goal of these classes should be to establish a baseline competency for the dietetics professional. Course work should be developed for graduate level students who desire a greater CAM focus in their practice. Both of these ideas can be achieved, but a standardization of the CAM education for dietitian is needed. There are of course concerns about including CAM as many of these practices are not credentialed or well researched. It is important that these practices are evaluated scientifically and that conventional medical practitioners have a firm grasp on practices in which their patients participate.

References

1. NCCAM (2009). "National Center for Complementary and Alternative Medicine." What is CAM. Retrieved April 20, 2009, from <http://nccam.nih.gov/health/whatiscam/overview.htm#>.
2. Cohen, M. (2003). "Complementary and integrative medical therapies, the FDA, and the NIH: definitions and regulation." Dermatologic therapy **16**(2): 77-84.
3. NCCAM (2007, 2007). "National Center for Complementary and Alternative Medicine." The Use of CAM. Retrieved June 14, 2009, from http://nccam.nih.gov/news/camstats/2007/camsurvey_fs1.htm.
4. Harris, P. and R. Rees (2000). "The prevalence of complementary and alternative medicine use among the general population: a systematic review of the literature." Complement Ther Med **8**(2): 88 - 96
5. Sharpe, P. A., H. M. Blanck, et al. (2007). "Use of complementary and alternative medicine for weight control in the United States." Journal of Alternative & Complementary Medicine **13**(2): 217-222.
6. Ono, Y., E. Hattori, et al. (2006). "Anti-obesity effect of Nelumbo nucifera leaves extract in mice and rats." Journal of Ethnopharmacology **106**(2): 238-244.
7. Lee, J., K. Chae, et al. (2008). "Regulation of obesity and lipid disorders by herbal extracts from Morus alba, Melissa officinalis, and Artemisia capillaris in high-fat diet-induced obese mice." Journal of Ethnopharmacology **115**(2): 263-270.
8. Allison, D. B. (2005). "Alternative Treatments for Weight loss: A critical review." Food Science and Nutrition **45**(5): 1-28.
9. Allison, D. B. (2005). "Alternative Treatments for Weight loss: A critical review." Food Science and Nutrition **45**(5): 1-28.
10. NCCAM (2007). Hoodia. Herbs at a glance, National Institutes of Health.
11. NCCAM (2007). Bitter Orange. Herbs at a glance, National Institutes of Health.
12. Han, K. K., J. M. Soares, et al. (2002). "Benefits of soy isoflavone therapeutic regimen on menopausal symptoms." Obstetrics & Gynecology **99**(3): 389-394.
13. Kronenberg, F. and A. Fugh-Berman (2002). "Complementary and Alternative Medicine for Menopausal Symptoms: A Review of Randomized, Controlled Trials." Annals of Internal Medicine **137**: 805-813.
14. Wong, V. C. K., C. E. D. Lim, et al. (2009). Current alternative and complementary therapies used in menopause. Gynecological Endocrinology, Taylor & Francis Ltd. **25**: 166-174.
15. Sherman, S., H. Miller, et al. (2005). "Research opportunities for reducing the burden of menopause-related symptoms." The American Journal of Medicine **118**(12, Supplement 2): 166-171.

16. Lin, M. C., R. Nahin, et al. (2001). "State of complementary and alternative medicine in cardiovascular, lung, and blood research: executive summary of a workshop." Circulation **103**(16): 2038-41.
17. Gardner, C. D., L. D. Lawson, et al. (2007). "Effect of Raw Garlic vs Commercial Garlic Supplements on Plasma Lipid Concentrations in Adults With Moderate Hypercholesterolemia: A Randomized Clinical Trial." Arch Intern Med **167**(4): 346-353.
18. NCCAM (2006). Garlic. Herbs at a glance, National Institutes of Health.
19. NCCAM (2006). Hawthorn. Herbs At A Glance, National Institutes of Health.
20. Smart, H. L., J. F. Mayberry, et al. (1986). "Alternative medicine consultations and remedies in patients with the irritable bowel syndrome." Gut **27**(7): 826-8.
21. Joos, S., T. Rosemann, et al. (2006). "Use of complementary and alternative medicine in Germany - a survey of patients with inflammatory bowel disease." BMC Complementary and Alternative Medicine **6**(1): 19.
22. Institute, S. K. C. (2008). "Boswellia." Cancer Information. Retrieved July 3, 2009, from <http://www.mskcc.org/mskcc/html/69149.cfm>.
23. Zhaoxiang, B., W. Taixiang, et al. (2006). "Effectiveness of the Chinese Herbal Formula TongXieYaoFang for Irritable Bowel Syndrome: A Systematic Review." Journal of Alternative & Complementary Medicine **12**: 401-407.
24. Gonzales, G. and L. Valerio (2005). "Toxicological aspects of the South American herbs cat's claw (*Uncaria tomentosa*) and Maca (*Lepidium meyenii*) : a critical synopsis." Toxicological reviews **24**(1): 11-35.
25. Hardin, S. (2007). "Cat's claw: an Amazonian vine decreases inflammation in osteoarthritis." Complementary therapies in clinical practice **13**(1): 25-8.
26. Hochberg, M., A. M. K. Gilpin, et al. (2004). "Effectiveness of acupuncture as adjunctive therapy in osteoarthritis of the knee: a randomized, controlled trial." Annals of Internal Medicine **141**(12): 901-10.
27. Clegg, D. O., D. J. Reda, et al. (2006). "Glucosamine, chondroitin sulfate, and the two in combination for painful knee osteoarthritis." The New England Journal Of Medicine **354**(8): 795-808.
28. Clegg, D., H. J. Williams, et al. (2008). "The effect of glucosamine and/or chondroitin sulfate on the progression of knee osteoarthritis: a report from the glucosamine/chondroitin arthritis intervention trial." Arthritis and rheumatism **58**(10): 3183-91. Zhang, X. (1998). "23 cases of chronic nonspecific ulcerative colitis treated by acupuncture and moxibustion." J Tradit Chin Med **18**: 188 - 191.
29. Barrocas, A., MD (1997). "Complementary and alternative medicine: Friend, foe, or OWA?" Journal of the American Dietetic Association **97**: 1373-1376.
30. Michalczyk, D. (2000). "Complementary/Alternative Medicine: Another Path to MNT Coverage?" Journal of the American Dietetic Association **100**(6): 632-633
31. Vickery, C. E. and N. Cotugna (2006). "Complementary and Alternative Medicine Education in Dietetics Programs: Existent but Not Consistent." Journal of the American Dietetic Association **106**(6): 860-866.
32. Touger-Decker, R., Cynthia A Thomson (2003). "Complementary and alternative medicine: Competencies for dietetics professionals." Journal of the American Dietetic Association **103**(11): 1465-1469.

Appendices

1. Survey 1
2. CAM Lesson for Registered Dietitians
3. Glossary
4. Chart
5. Survey 2

Survey of Registered Dietitians

Good Day: I want to begin by expressing my appreciation for your help with research for my Masters thesis in nutrition science at Georgia State University. My intention is to create a continuing education unit (CEU) for registered dietitians around the topic of complementary and alternative medicine (CAM). This is a very large field. To ensure that my focus is in line with the interests of RD's in the Atlanta area I designed this survey. Your answers will be used to decide which topic to explore in a CEU and the most desirable delivery system for this information. I will then produce a CEU lesson and post test for use by the participants. This will be followed by a post test and post lesson survey.

Risks: There are no risks associated with this research. If you choose not to participate at any time there will be no repercussions.

Benefits: Those who participate in this project will be able to apply for continuing education credits for reading the articles included in the unit. The lesson serves as a compilation of research around the chosen topic helping to focus the dietitians self-study work, as described in the Professional Development Portfolio Guide under CPE guidelines, page 9. If you do not have your PDP guide you can also access this information at the CDR (commission on dietetic registration) website <http://www.cdrnet.org/pdrcenter/portfoliotoc.htm>.

Voluntary Participation: Participation in research is voluntary. You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or stop participating at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled.

Confidentiality: We will not be collecting any personal information.. For this reason your post test evaluation will be in the form of an answer key for your own use. I will compile each answer sheet without personal identification. Your personal information is not needed to obtain CEU's since you will need to apply for CEU credit from CDR individually. This lesson will serve to compile the articles and offer an introduction, glossary and synopsis of the research.

Contact Person: If you need any further information about this research please contact Gwenyth Johnson 770-833-8670 or gwenyth70@hotmail.com. If you have questions or concerns about your rights as a participant in this research study, you may contact the Institutional Review Board (IRB). Please contact Susan Vogtner at email address svogtner1@gsu.edu or phone number 404-413-3513.

If you continue with this survey you are indicating that you understand the purpose of the research and its intended use. Continuation with the survey implies informed consent and voluntary participation in this research.

Thank you for your participation.
Gwenyth Johnson

Survey I

Please circle the letter that most accurately answers the question. If your answer is other, please write an appropriate answer for that question.

1. Please select the answer that best describes the number of years you have been in practice as a dietitian.
 - a. 0-1
 - b. 2-5
 - c. 6-10
 - d. 11-20
 - e. 21+
2. Please select the answer that best describes your practice setting.
 - a. Urban
 - b. Rural
 - c. Suburban
3. Are you male or female?
 - a. Female
 - b. Male
4. Please select the decade that best describes your age.
 - a. 20s
 - b. 30s
 - c. 40s
 - d. 50s
 - e. 60s
 - f. 70s
 - g. 80s +
 - h. Other: Please describe: _____
5. Please select the answer that best describes your race.
 - a. White
 - b. Black/African American
 - c. Asian
 - d. American Indian/Alaskan Native
 - e. Hawaiian/Pacific Islander
 - f. Other: Please describe _____

6. Would you describe yourself as Hispanic or Latino(a)?
 - a. Yes
 - b. No
7. Are you employed outside the home?

- a. No
- b. Yes; Part time
- c. Yes; Full time

8. How would describe your area of practice?

- a. Clinical (in patient)
- b. Out patient
- c. Community
- d. Private practice
- e. Other: (Please describe)

9. Are you interested in Complementary and Alternative Medicine (CAM)?

- a. Yes
- b. No (if you answer is no, thank you for your participation)
- c. Maybe

10. If answer 9 is yes, which of the following best describes your interest in CAM?

- a. I am interested in CAM for my personal use and knowledge.
- b. I am interested in CAM for my professional practice.
- c. I am interested in how my clients may be utilizing CAM.
- d. I am not sure.
- e. Other. (Please describe)

11. Are you currently using CAM in your practice?

- a. Yes
- b. No

12. If yes, please describe:

13. Which Topic(s) are you most interested in from CAM fields of study?(check all topics of interest)

- a. Complementary and Alternative (CAM) treatments used for weight loss
- b. CAM treatments used for inflammatory conditions
- c. CAM treatment used for menopause
- d. CAM treatments used for irritable bowl syndrome (IBS) and other digestive diseases.
- e. CAM treatment used for cardiovascular disease.
- f. CAM treatment used for chronic pain
- g. Other: (Please describe)

14. Which delivery format for the information would be most helpful to you?

- a. Continuing education unit (CEU) text with post test
- b. CEU text with post test and summary handout for reference
- c. CEU text with post test and chart for easy reference
- d. Other. (Please describe)

15. What length of continuing education unit would you be interested in receiving covering one of the above listed topics?

- a. 1 hour
- b. 5 hour
- c. 10 hour
- d. 15 hour
- e. Other: (Please describe)

16. Any additional comments?

Thank you for your participation in this survey and project. The continuing education unit will be ready for your use as of June 25, 2009 at www.eatbreathebewell.com If you would like information from the final report please see this same website after August 2009 for final report and details.

Introduction

Complementary and alternative medicine (CAM) is a frequent topic in the popular media. It is estimated that by 2010 two-thirds of the US population will use some sort of CAM treatment(s) (1). Given its popularity, one might assume that CAM is well understood, but this does not appear to be the case (2). Conventional Western health care practitioners are not well versed in these treatments and practices. Research indicates that some CAM treatments such as Tai Chi for arthritis pain management, saw palmetto for benign prostatic hyperplasia, and even St. Johns Wort for mild depression are effective and safe for many (3). There is the potential, however, for adverse effects with some treatments. Other treatments may work but can also interact with Western medication. Consumers need a member of the health care team to turn to for advice about their CAM treatments of choice. This is the first of what will be a series of education units on the topic of CAM treatments and practices designed for registered dietitians.

According to the National Center for Complementary and Alternative Medicine (NCCAM), complementary and alternative medicine is a “term used to describe health care practices outside of the realm of conventional medicine.” It includes a variety of medicinal practices not widely accepted by the Western medical community.

Complementary indicates practices that would be used in conjunction with conventional practices. For example, aromatherapy has been used in nursing homes to help stimulate appetite, to calm agitated patients and to energize the lethargic (4). While research is still being conducted to substantiate its use, aromatherapy is growing in popularity as a complementary treatment with traditional Western practices.

Alternative indicates practices that might be used instead of conventional Western medicine. NCCAM gives the example of following a therapeutic diet for cancer treatment instead of the recommendation of a Western physician, such as chemotherapy or surgery. A diet of this sort might be a raw food or live food practice (a practice where participants believe that food must be raw to deliver its life energy to the person consuming it). One theory is that consuming cooked food does not allow the immune system to function as it should and that consuming raw produce whole or liquefied will invigorate the body and immune systems (5). Little research exists to support this method at this time.

Integrative medicine is the combination of conventional medical practices with CAM practices. This is a burgeoning field. In integrative medicine, CAM practices are only included once they have been shown to be safe and effective. As CAM research expands, so will the scope of integrative medicine (6).

There are 5 primary types of CAM practices described by NCCAM: whole medical systems, mind body medicine, biologically based practices, manipulative or body based practices, and energy medicine. Whole medical systems are practices that are based on “complete theory and practices” (7). These are systems that developed earlier in history and through different traditions

from conventional Western medicine. The National Institutes of Health (NIH) recognize four complete medical systems: two from Eastern traditions, ayurveda and traditional Chinese medicine (TCM), and two from Western traditions, homeopathy, and naturopathy.

Ayurveda is a practice that originated thousands of years ago in India. This is the life (ayur in Sanskrit) science (veda in Sanskrit) that accompanies the practice of yoga. This practice utilizes food, herbs, massage, physical activity and more to balance the individual body based on its specific constitution. There are three types of constitutional life forces or doshas that combine in different ratios to make up each person's constitution: vata (air, ether), pitta (fire and water), and kapha (water and earth). Ayurveda emphasizes lifestyle choices that enhance health (6, 7).

Traditional Chinese Medicine (TCM) originated in China thousands of years ago and has developed into the system used today. Practitioners treat a variety of conditions with herbs, acupuncture and other treatments. This system is designed to balance the yin and yang (opposing forces in nature) and balance the flow of Chi through the body to alleviate disease (6, 7).

Homeopathic Medicine was developed in Germany by Samuel Hahnemann during the late 1700s and was brought to the United States by Hans Burch Gram during the early 1800s. This system is based on the "like cures like" principle. Hahnemann observed that certain substances caused symptoms similar to different diseases and hypothesized that these substances might cure the disease of which symptoms they mimicked. This system has two other prominent principles. The first principle is potentization, which is the idea that a substance diluted in water and shaken vigorously at each step will retain the therapeutic usefulness of the original substance. The second principle is the idea that the treatment should be based on the individual's total health picture and not just the symptoms of a disease (6, 7).

Naturopathic Medicine, while having its beginnings in 18th century Germany, was named and popularized in the US by Benedict Lust. Lust experienced some of the primary treatments during his life in Germany during the late 1800s. Naturopathy is based on two primary beliefs: first that nature has healing power and second that living things have the ability to maintain or return to a state of balance or health. The treatments employed by this system include physical activities, herbal treatments, diet, exposure to sun and air and hydrotherapy. The system is very prevention focused and considers the physician a teacher (6, 7).

Mind-body practices are those that encourage a connection or awareness between the mind and body. They are practices designed to expand the mind's capacity to have an impact on physical issues. NCCAM lists meditation, prayer and other mental healing techniques as mind-body medicine. Qi gong practitioners, yogis and Tai Chi masters would also consider their practices to be mind-body techniques as they aid in development of a mindful connection between the mind and body (8). These practitioners believe that, with this connection between the mind, body and spirit, the individual will be able to identify subtle changes in his/her physical state and

take action, including seeking medical attention, more quickly. Tai Chi and Qi gong are somewhat similar practices that work with Qi or Chi, the natural energy in the universe. These practices are designed to move Chi through and around the body to achieve balance and a desired level of health. Tai Chi is much more dance-like and was originally based on a martial art. Qi gong is a more stationary practice used to cultivate discipline as well as balanced energy (14, 15).

Biologically-based practices, according to NCCAM, involve the use of items found in nature. This includes food therapies and herbal therapies. Research is limited on some items in this category, such as cancer treatment with shark cartilage, and plentiful for other items, such as foods and some herbal products (6).

Manipulative or body-based practices are those that move the body in some way to achieve a change in physical state. These practices include massage therapy, neuromuscular therapy, Rolfing, myofascial release, chiropractic, osteopathic manipulation, and more. These practices are designed to relieve imbalances in the soft tissues and between bones, allowing the body to heal itself (9, 10).

The final CAM type is energy therapy. The NIH describes two types of energy therapy: biofield therapies and bioelectromagnetic-based therapies. Biofield therapies include such treatments as reiki and therapeutic touch. Bioelectromagnetic-based therapies are those that employ magnets of various types to alter the magnetic field of the body. As with all of the other types of CAM listed, the goal of these treatments is to aid the body in achieving balance instead of an imbalance or diseased state (6, 11).

Who is using CAM and what types?

CAM use is increasing. One study noted a 42% increase in self-reported use of CAM therapies between 1990 and 1997 (12). As previously mentioned, it is estimated that two-thirds of the US population will use at least one type of CAM treatment by 2010 (13). The reasons for this prevalence of use are many: a change in the needs and values of the population, easy access to information across the world, increased incidence of chronic disease and possibly a desire for greater autonomy in the individual's own health. The shifts in natural products used appear to follow this idea of control over one's own chronic disease. The NCCAM reports that CAM use occurs with children. This use increases throughout the life span, with the highest use rates during the fifth decade of life. Even by the eighth decade of life usage appears to occur in nearly 25% of the population. While CAM usage is widespread in the United States, those who use CAM are more likely to be women, have a higher level of education and are more likely to live in Western regions of the country (13).

Many believe that 'if it is natural, it must be safe', but we know this is not always the case. As already mentioned, there are risks associated with using some CAM therapies and medications. Some CAM therapies carry their own risk of toxicity or other safety issues. Research is still

needed for many types of therapies, but much has already been done. Medications such as Warfarin and other anticoagulants are frequently identified as interacting with herbal medications. For example, the herbal treatments ginkgo, St. Johns' Wort and ginseng may cause an increased risk of bleeding when taken with Warfarin or other anticoagulants. Other medications that can interact with herbal medicines include antidepressants, antibiotics and even oral contraceptives. Research that provides information about herbal medicines, their uses and contraindications is critically needed as more people use CAM treatments and therapies (16). Many patients already discuss dietary supplements with dietitians, and it makes sense that these professionals be knowledgeable in this field of study. As part of their training registered dietitians have experience with food/drug interactions, dietary and sports supplementation, RDAs, evidence based research practices and dissemination of healthy lifestyle information. Dietitians along with physicians, nurses and licensed CAM professionals may make up the new idea of a comprehensive health care team.

Chapter 1

Inflammatory conditions such as rheumatoid (RA) and osteoarthritis (OA) are some of the most frequently treated conditions using CAM practices. We also see from the NCCAM usage statistics that pain management is another primary interest of CAM consumers (13). This chapter will explore therapies frequently used for RA and OA and will provide several studies for further reading and continuing education credit.

Rheumatoid arthritis (RA) is an autoimmune condition that is inflammatory in nature. This means that the immune system that the body uses to fight disease attacks the body itself. In the case of RA the immune system attacks the joints and tissues around them, specifically the tissues that line the joints (3). The symptoms of this condition include stiffness, particularly in the morning, generalized fatigue, and joint swelling and damage (17). Since this is an autoimmune disease it is critical that the patient seek treatment from a rheumatologist to help limit the damage and disability that is possible with this disease. Conventional Western medical treatments for RA are as follows: non-steroidal anti-inflammatory drugs (NSAIDs), disease-modifying antirheumatic drugs (DMARDs), biological response modifiers, and corticosteroids. Non-drug treatments are also used, such as splints, special shoes, canes and other devices (3).

Osteoarthritis (OA), while also a disease of joint inflammation, is quite different. This is the most common type of arthritis today and is generally seen in the elderly. This type of arthritis affects the cartilage within the joint. Small deposits of bone called osteophytes or bone spurs form on the ends of what was smooth cartilage-covered bone and impede movement. These bone fragments can break off and remain floating in the fluid within the joint, further adding to decreased range of motion and pain. Unlike RA, OA does not damage the soft tissues in and around the joint. Typical conventional medical treatments are used to control pain and limited mobility. These treatments include: exercise, weight loss, rest, NSAIDs, mild narcotics, acetaminophen, corticosteroids, hyaluronic acid, heat/cold therapy and even surgery (18).

Arthritis of both types mentioned in this chapter is readily treated with conventional Western medicine. This begs the question, who is using CAM therapies for these same diseases? Callahan and colleagues studied patients who were under the care of physicians, both primary care and specialists, to see who also used CAM. They found that the majority of patients being treated with Western therapies were also seeking alternative and complementary care for their conditions. Ninety percent of those who were under the care of a specialist also used at least one CAM therapy. Nearly 83% of those who were under the care of a primary care physician also used at least one CAM therapy. As with CAM use in general, these researchers found that women and those with higher levels of education were more likely to utilize these therapies. The CAM explored in this particular study were mind body therapies, alternative medical providers, ointments, body based therapies, movement therapy, spiritual, special diets, vitamin and mineral supplements, and dietary supplements (19).

Thunder God Vine

Thunder God Vine (TGV) or Chinese Thunder God Vine is an herbal supplement that has been used for a very long time in Traditional Chinese Medicine (TCM) to treat inflammatory conditions such as RA and OA. It is a perennial vine native to China and is a member of the *Celastraceae* family. This plant works by inhibiting cytokine production and other mediators of proinflammatory genes (3, 20). The active components of TGV are triptolides and triptolides. TGV has been shown to decrease inflammation; however, this is not without side effects. Long-term use of this herb, five years or more, has been associated with bone demineralization and osteoporosis in women (21). Other side effects include hair loss, dry mouth, leucopenia, thrombopenia, and more (21). Parts of this plant, the leaves, flower, main stem and skin covering the roots, are quite dangerous. They are poisonous enough to cause death. For this reason, it is imperative that a properly prepared supplement be used. Researchers recommend waiting for use in the United States until such a standardized product becomes available. It is never recommended that individuals prepare this for themselves (3, 20).

Gamma Linoleic Acid

Gamma Linoleic Acid or GLA is another frequently used treatment for arthritis. It is readily found in nature in the form of evening primrose oil, borage oil and seed and black current seed. A diet containing evening primrose oil has resulted in elevated levels of GLA in studies (21). Since GLA is a precursor for prostaglandin E1, a known anti-inflammatory eicosanoid, it is believed that this is the anti-inflammatory mechanism for GLA. There are side effects with this supplement, too. Borage contains small amounts of PA, pyrrolizidine alkaloids, compounds that are known hepatotoxins (21). There are no recorded cases of adverse effects from this particular chemical, but it is noteworthy. Another potential side effect of GLA is increased risk of bleeding while on anti-clotting medications, and it is not recommended during pregnancy (3).

Fish oil

Fish oil is also used for treatment of arthritis and inflammatory conditions. This treatment has had some encouraging results; however, studies have been relatively small and more research is needed to reveal its beneficial mechanism. Like many of the CAM supplements discussed, fish oil can lead to increased bleeding and bruising when taken in conjunction with anti-clotting medications (3).

Ginger and Turmeric

Ginger and turmeric are two plants that are used in many medical traditions including Ayurveda and TCM. Both plants are from the same family, the *Zingibeaceae* family. The rhizome or below ground stem are used for treatments for both plants. Ginger has been researched with good results for decreasing nausea and vomiting in cases of pregnancy and motion sickness. It is also being investigated as an anti-inflammatory treatment. Ginger extract contains gingerols,

capsaicin and curcumin and has been shown in labs to decrease TNF alpha gene expression and, therefore, may be useful for OA (21). Its side effects are primarily gastrointestinal in nature. In large quantities it has been shown to cause gastrointestinal distress for 45% of the population in a specific study (3). Turmeric is well known for its brilliant color and use in curry and fabric dye. It also contains curcumin and is being researched for its anti-inflammatory activity. As for side effects, turmeric may also increase bleeding with anti-clotting drugs and can aggravate gallbladder contractions, making it contraindicated for anyone with gallbladder disease (3).

Special Diets

Special diets are found for most if not all conditions, some with a scientific basis and some without. A diet recommended by many, including Western physicians, for inflammatory conditions is one that restricts a number of foods. These restricted foods are plants from the nightshade family (white potatoes, tomatoes, eggplant, and peppers), dairy products, citrus fruits, sweets, coffee and animal proteins. The premise is that these foods may increase inflammatory mediators and that their elimination will decrease the likelihood of inflammation. This has not been well established by research, and the recommendations remain to consume a balanced diet (3).

Hydrotherapy

Hydrotherapy is both a CAM and a conventional treatment. This therapy uses warm baths, mineral baths, hot springs and so on to treat the pain and stiffness of arthritic conditions. Massage therapists use these types of treatments frequently alone and in combination with hot and cold packs (10). These types of treatments have been used in most ancient cultures, Greek, Roman, Japanese, European and Israeli, to mention a few. Generally patients agree that this is a great feeling treatment, but more research is needed to explore how it should be used and what the specific benefits are. This type of treatment is generally regarded as safe. This treatment type should be avoided by those who have conditions such as pregnancy, heart disease, lung disease, circulatory disorders or any other condition that react adversely to dramatic changes in temperature (3).

Mind Body Medicine

Mind body medicine is a category of CAM that is used to treat nearly all conditions. This category includes spiritual and religious practices, relaxation techniques, meditation, Tai Chi, and yoga, to name a few. This type of therapy is based on the idea that the body has the ability to heal and that the mind and the spirit are connected to this capacity (8). Research indicates that these methods may have a significant impact as an adjunct therapy. Mind body treatments appear to help the individual relax and experience an increased quality of life, making it a true integrative practice when used with conventional medical treatments for RA and OA (3).

Cat's Claw

Cat's claw, *una de gato* or *Uncaria tomentosa* or *Uncaria guainensis*, is a perennial vine that grows in rainforest regions of Central and South America. This vine grows for as long as twenty years and is quite thick and woody. The indigenous peoples of these regions have used this plant to treat a variety of conditions, including arthritis. There are three compounds that are touted with its medicinal uses: quivonic acid glycosides, polyhydroxylated triterpenes and alkaloids. These active ingredients are reported to have several actions, including inhibition of TNF alpha gene expression and the ability to scavenge free radicals (23). This particular treatment will be further discussed later in this chapter in the context of an original research study.

Acupuncture

Acupuncture, an integral part of Traditional Chinese Medicine, is a system of placing metal needles into specified points on the body along meridians. They are used to alter or balance both the flow of Chi or Qi through the body and the balance of yin and yang (the two opposing forces in nature) to alleviate disease (24). Research has shown that this practice can decrease pain in a number of conditions and OA in particular. Studies continue around the topic of acupuncture, and many are sponsored by NCCAM. At this point the information about treatment of RA is purely anecdotal and not from research studies. Side effects from this particular treatment are very minimal with very few complaints. Potential spread of infection was an issue for acupuncture, but in the United States sanitary single-use needles are required, eliminating this issue (3). As with cat's claw, this topic will be revisited in a summary of randomized controlled trial.

Glucosamine and Chondroitin

The next treatments are probably the most popular or at least best known non-conventional treatments for arthritis in this country, glucosamine and chondroitin sulfate. Glucosamine is an amino sugar, a molecule made of two glucose molecules and two amino groups, that is found in the fluid that surrounds the joints. Supplemental glucosamine is obtained from shrimp, crab and lobster shells or it is laboratory made. It is used by the body to make and repair cartilage. Chondroitin is a substance found in cartilage of joints. The supplement chondroitin is obtained from shark and cattle. Side effects appear to be mild but do include some upset stomach. Research has shown some benefit from the use of these supplements, but thus far results have been modest (3). This, too, will be re-examined in a summary of a randomized controlled trial. This trial discussed in the article summary does not show benefit to those with mild to moderate arthritis pain but suggests possible benefit for those with moderate to severe pain.

The following are summary reports of three articles that are recommended for additional reading and use for continuing education credit. All three look at different CAM therapies used for osteoarthritis. While these practices have been used for rheumatoid arthritis, the research has been thus far OA-oriented.

Article Summaries

I.

Sandoval M, Miller MJ, Okuhama NN, Bustamante SA, Rodriguez Z, Piscocoy J. Efficacy and safety of freeze-dried cat's claw in osteoarthritis of the knee: mechanisms of action of the species *Uncaria guainensis*. *Inflammation Research*. 2001;50(9):442-448.

Cat's claw is a traditionally used perennial plant from tropical regions of Central and South America. Its primary use has been to treat inflammatory conditions such as arthritis. This study was designed to "assess this potential and compare the anti-inflammatory and antioxidant activity of the two species" of this plant, *Uncaria tomentosa* (UT) and *Uncaria guainensis* (UG). This component of the study was conducted in a laboratory setting.

The researchers have described a number of protective effects that the extract of the plant has against oxidative stress such as "peroxynitrite (implicated as a mediator of arthritis and other chronic inflammatory disorders), UV radiation, and free radical induced by cytotoxicity." They also observed that cat's claw prevents gastrointestinal damage from high dose usage of NSAIDs. This is most likely due to the decreased gastric inflammation caused by this plant.

This set of researchers observed that cat's claw is an effective inhibitor of TNF alpha gene expression *in vitro* and *in vivo*. Previous research has established the importance of control of TNF alpha gene expression as a central part of the arthritis treatment process. This mechanism makes this particular supplement potentially very useful to those with arthritic conditions.

This study design is a prospective, multi-center, randomized, double blind, placebo-controlled, and parallel trial. The sample was 45 male participants aged 45-75. They all had a diagnosis of arthritis, reporting pain most days of the previous month and with radiological evidence of osteophytes in at least one compartment of the knee. There was a seven-day washout period for NSAIDs prior to beginning the study.

The cat's claw was obtained from tropical Peru and the species confirmed by university experts. A dose of 100 mg of the herb was given daily to the experimental group in a single capsule. The placebo group also received a single capsule daily without the herb. Laboratory procedures were used to evaluate the free radical scavenging activity, as well as the antioxidant activity.

The laboratory component of this investigation found that there is very little difference between the two species. UG does appear to have a slightly higher antioxidant activity than UT, but it was not great enough to make an official distinction. Further elucidated in the lab were the three functions of cat's claw. It was shown to inhibit TNF alpha gene expression, scavenge free radicals and inhibit PGE2 production, possibly inhibiting COX 2 expression. The three functions take place at different doses. The lowest does was needed for TNF alpha inhibition, then antioxidant activity and finally the largest dose was needed for the suggested COX 2

inhibition. All three functions are important for the treatment of arthritis and inflammatory conditions.

The clinical study showed that the cat's claw group had a significantly decreased pain level during activity as compared to the placebo group. There was no difference in pain reported by the treatment or the placebo groups at rest. This may be a significant finding because a primary complaint of arthritis is decreased activity because of pain. If further research confirms the role of cat's claw in reducing gastric inflammation due to NSAID consumption, then this may be an important treatment in conjunction with conventional medicine.

This study was quite small but it has a solid design and evaluated very practical factors. It is a very good basis for a larger study. There is, of course, need for a long-range study to examine the impact of long-term treatment with cat's claw. The results from this study show that cat's claw may be a useful treatment for inflammatory conditions due to its ability to decrease TNF alpha expression, COX 2 expression and antioxidant activity.

II.

Hochberg M, Gilpin AMK, Lee W, Langenberg P, Lao L, Berman B. Effectiveness of acupuncture as adjunctive therapy in osteoarthritis of the knee: a randomized, controlled trial. *Annals of Internal Medicine*. 2004;141(12):901-910.

The investigation of acupuncture is one that NCCAM has been supporting for a variety of conditions. This group of researchers looked at this component of TCM as an adjunct treatment used with conventional treatments. Of particular interest was acupuncture's ability to help control pain and "reduce functional limitation". The group first conducted a pilot study and a single blind study with sample sizes of 12 and 73, respectively. These two investigations gave sufficient results for the team to proceed with a much larger study.

The study design was prospective, randomized and placebo-controlled. The sample population size was 570 individuals. Participants were aged fifty years or older and diagnosed with osteoarthritis. They must have reported pain in the knees most days of the previous month and have radiological evidence of osteophytes in at least one site. These individuals were randomly assigned to one of three groups: a treatment or acupuncture group, a sham acupuncture group or an education group. The study was conducted for 26 weeks, and outcome measures were taken at weeks 8 and 26. The primary outcome measures were the Western Ontario and McMaster University Osteoarthritis Index (WOMAC) pain and function scores.

The results from this study showed a decrease in pain for the subjects in the true acupuncture group as compared with those in the other two control groups. At the 14th week there had been a drop in pain score of 3.6, which translates into a 40% decrease in reported pain. Function scores also improved for the true acupuncture group when compared with the two controls. The p value

for this change was 0.01 by week 8 and 0.009 by week 26. Once again the researchers report a 40% decrease in pain by week 14.

There were 26 adverse events that occurred during the course of this study. There were 14 in the true acupuncture group, 5 in the sham group and 7 in the education group. After evaluation it was decided that none of these incidents were treatment related.

The participants in this study were not asked to stop taking their medications. At baseline there were 11% taking nonselective analgesics, 31% taking nonselective NSAIDs, 28% taking COX 2 selective inhibitors, and 6 % receiving opioid treatments. This is of interest because the decreased pain and increased functional levels were on top of the already familiar medication benefit, making this an integrative medical practice and a model for other CAM practices to explore.

This study was much larger than the previous one and was conducted with some controls. It would have been helpful to have a true placebo, perhaps a no education group, for additional comparison. A follow up would also have been helpful to examine the need for ongoing treatment. Despite these criticisms, this study was a strong step in the evaluation of acupuncture as a treatment for arthritis and possibly other conditions.

III.

Clegg DO, Reda DJ, Harris CL, Klein MA, O'Dell JR, Hooper MM, Bradley JD, Bingham CO, 3rd, Weisman MH, Jackson CG, Lane NE, Cush JJ, Moreland LW, Schumacher HR, Jr., Oddis CV, Wolfe F, Molitor JA, Yocum DE, Schnitzer TJ, Furst DE, Sawitzke AD, Shi H, Brandt KD, Moskowitz RW, Williams HJ. Glucosamine, chondroitin sulfate, and the two in combination for painful knee osteoarthritis. *The New England Journal Of Medicine*. 2006;354(8):795-808.

This study is part of the GAIT trails supported by NCCAM and can be accessed at this website <http://content.nejm.org/cgi/content/full/354/8/795?ijkey=CWQQcspVDtdCs&keytype=ref&siteid=nejm> or by going to the NCCAM site <http://nccam.nih.gov/research/results/gait/> and choosing the published article link.

“The dietary supplements glucosamine and chondroitin sulfate have been advocated especially in the lay media, as a safe and effective option of management of osteoarthritis.” Previous studies have touted the benefits of these two supplements and their combined product. After review of early studies, however, there were issues found in the quality of the studies (controls, sample sizes and research methods). The GAIT trial (Glucosamine/Chondroitin Arthritis Intervention Trial) a 24-week trial is the most recent answer to these issues.

The study design is a prospective, randomized, double blind, placebo-controlled and celecoxib-controlled multi-center trial. It was sponsored by National Institutes of Health NCCAM. The sample population consisted of 1583 patients men and women, aged 40 and older. They all were required to have a diagnosis of osteoarthritis defined with pain in the knee for most days of the

previous month and radiological confirmation of osteophytes in at least one site. These two exclusion factors were the reason for the 3238 initial population's decrease to 1583. The sample population was divided into five groups: 500 mg of glucosamine taken 3 times daily, 400 mg of sodium chondroitin sulfate taken 3 times daily, 500 mg glucosamine and 400 mg chondroitin sulfate taken 3 times daily, 200 mg of celecoxib (Celebrex™) taken daily and the placebo group. The primary outcome for this study was the WOMAC pain score, an expected 20% decrease from base line to week 24.

The results from this study showed that there were a number of individuals in all 5 groups that had a 20% decrease in the pain score. When looking at the entire population, the only group that had a statistically significant change was the Celebrex™ group ($p = 0.008$). There were clinically significant changes to the combined glucosamine/chondroitin group ($p = 0.09$). When the sample is broken down into the moderate to severe pain group and the mild to moderate pain group the CAM therapy shows a greater impact. The combined treatment for moderate to severe pain sufferers had a p value of 0.002 making the 20% decrease in pain statistically significant. This group did not show a significant change for the Celebrex™ population ($p = 0.06$).

There were adverse events that occurred in this study. They occurred relatively evenly across all of the groups. Seventy-seven of the events were reported for 61 individuals. The majority of adverse effects were mild. Three of the adverse effects were judged to be related to the study treatment. An instance of congestive heart failure was observed in the combined therapy group, an instance of chest pain was observed in the glucosamine group and an incidence of stroke was reported in the Celebrex group. These three events show the need for continued research with particular attention to safety and specific health conditions.

In addition to the need for risk information, additional research is needed addressing ongoing use of these products. What are the side effects after 5 or 10 years or use, and are there confounding medical conditions that make these therapies inappropriate? This study did show, however, that for those exhibiting the more severe symptoms the combined CAM treatment may offer hope.

Conclusion

As is evidenced by these three studies, research into complementary and alternative medical practices is increasing and improving, but more is needed. The public continues to show interest in these traditional and often self-directed therapies. This interest and use necessitates the training of conventional health care providers in these modalities, and registered dietitians (RDs) are a logical choice to help consumers with this need. RDs work closely with physicians and nurses and are versed in food/drug interactions. They already field questions about dietary supplements and lifestyle modifications and their focus on research evaluation and evidence-based practice prepares dietitians for this very challenge.

The National Institutes of Health started the National Center for Complementary and Alternative Medicine or NCCAM. The mission of this center is “to explore CAM practices in the context of rigorous science, to increase CAM research capacity, and to disseminate information to the public and professionals.” The NCCAM website <http://nccam.nih.gov/> is a research-based resource for those interested in specific topics, listing of herbal supplements information, current clinical trials, potential grants and CAM news. Please visit this website and develop you knowledge of this emerging field.

Please complete the post test and post survey. These tools will be used to improve the chapter and develop future chapters.

Thank you for your participation

Gwenyth Johnson RD. LD.

References

1. Bhatt N, Pushpangadan P, Warude D, Patwardhan B. Ayurveda and traditional Chinese medicine: a comparative overview. *Evidence-based complementary and alternative medicine*. 2005;2(4):465-473.
2. Brismee J-M, Paige RL, Ming-Chien C, Boatright JD, McCaleb JA, Quintela MM, Du F, Xu KT, Chwan-Li S. Group and home-based tai Chi in elderly subjects with knee osteoarthritis: a randomized controlled trial. *Clinical Rehabilitation*. 2007;21(2):99-111.
3. NCCAM. *Rheumatoid Arthritis and complementary and Alternative Medicine* September 2005.
4. National Cancer Institute. Aromatherapy and Essential Oils. Webpage. Available at: www.cancer.gov/cancertopics/pdq/cam/aromatherapy/patient. Accessed June 12, 2009
5. Kehr W. Cancer Tutor. <http://cancertutor.com/Cancer/RawFood.html>. Accessed June 1, 2009.
6. NCCAM. *CAM Basics*: National Institutes of Health, National Center for Complementary and Alternative Medicine; February 2007.
7. NCCAM. *Whole Medical Systems: An Overview*: National Institutes of Health, National Center for Complementary and Alternative Medicine; October 2004.
8. NCCAM. *Mind-Body Medicine: An Overview*: National Institutes of Health, National Center for Complementary and Alternative Medicine; October 2004.
9. NCCAM. *Massage Therapy as CAM*: National Institutes of Health, National Center for Complementary and Alternative Medicine; September 2006.
10. Fritz S. *Mosby's Fundamentals of Therapeutic Massage*. Second Edition ed. St. Louis, Missouri: Mosby's Inc.; 2000.
11. NCCAM. *Magnets for Pain* National Institutes of Health, National Center for Complementary and Alternative Medicine; March 2008.
12. Rees R, Harris P. The prevalence of complementary and alternative medicine use among the general population: a systematic review of the literature. *Complementary Therapies in Medicine*. 2000;8(2):88-96.
13. NCCAM. *The Use of Complementary and Alternative Medicine in the United States*: National Institutes of Health, National Center for Complementary and Alternative Medicine; December 2008.
14. NCCAM. *Tai Chi: An Introduction*: National Institutes of Health, National Center for Complementary and Alternative Medicine. June 2006.
15. Cohen KS. *The Way of Qigong*. New York, NY: Ballentine Books; 1997.
16. Ernst E, Izzo AA. Interactions between herbal medicines and prescribed drugs: a systematic review. *Drugs*. 2001; 61(15):2163-2175.
17. Bourguignon C, Taibi D. The role of complementary and alternative therapies in managing rheumatoid arthritis. *Family & community health*. 2003;26(1):41-52.
18. National Institutes of Health NCCAM. Osteoarthritis. May, 2006; web publication. Available at: www.niams.nih.gov/Health_Info/Osteoarthritis/default.asp. Accessed May 26, 2009

19. Sniezek J, DeVellis R, Sloane P, Sleath B, Currey S, Xiao C, Brady T, Mielenz T, Wiley-Exley E, Callahan L. Use of complementary and alternative medicine among patients with arthritis. *Preventing chronic disease*. 2009;6(2):A44.
20. NCCAM. *Thunder God Vine*: National Institutes of Health, National Center for Complementary and Alternative Medicine. October 2007.
21. Sigal L, Setty A. Herbal medications commonly used in the practice of rheumatology: mechanisms of action, efficacy, and side effects. *Seminars in arthritis and rheumatism*. 2005;34(6):773-784..
22. Hardin S. Cat's claw: an Amazonian vine decreases inflammation in osteoarthritis. *Complementary therapies in clinical practice*. 2007;13(1):25-28.
23. Gonzales G, Valerio L. Toxicological aspects of the South American herbs cat's claw (*Uncaria tomentosa*) and Maca (*Lepidium meyenii*) : a critical synopsis. *Toxicological reviews*. 2005;24(1):11-35.
24. NCCAM. *Acupuncture: An Introduction*: National Institutes of Health, National Center for Complementary and Alternative Medicine. December 2007.
25. Sandoval M, Miller MJ, Okuhama NN, Bustamante SA, Rodriguez Z, Piscocoya J. Efficacy and safety of freeze-dried cat's claw in osteoarthritis of the knee: mechanisms of action of the species *Uncaria guianensis*. *Inflammation Research*. 2001;50(9):442-448.
26. Hochberg M, Gilpin AMK, Lee W, Langenberg P, Lao L, Berman B. Effectiveness of acupuncture as adjunctive therapy in osteoarthritis of the knee: a randomized, controlled trial. *Annals of Internal Medicine*. 2004;141(12):901-910.
27. Clegg DO, Reda DJ, Harris CL, Klein MA, O'Dell JR, Hooper MM, Bradley JD, Bingham CO, 3rd, Weisman MH, Jackson CG, Lane NE, Cush JJ, Moreland LW, Schumacher HR, Jr., Oddis CV, Wolfe F, Molitor JA, Yocum DE, Schnitzer TJ, Furst DE, Sawitzke AD, Shi H, Brandt KD, Moskowitz RW, Williams HJ. Glucosamine, chondroitin sulfate, and the two in combination for painful knee osteoarthritis. *The New England Journal Of Medicine*. 2006;354(8):795-808.
28. AHRQ. S-Adenosyl-L-Methionine for Treatment of Depression, Osteoarthritis and Liver Disease: Southern California Evidence-Based Practice Center 2002. 64.

Post Test

1. What is CAM?
 - a. Conventional American Medicine
 - b. A new product for healing sun burn
 - c. Complementary and Alternative Medicine
 - d. Clinically Advanced Medical Practice

2. Examples of a whole medical system are...
 - a. Acupuncture and Acupressure
 - b. Yoga and Tai Chi
 - c. Ayurveda and Traditional Chinese Medicine
 - d. Homeopathy and Naturopathy
 - e. C and D

3. Mind body medicine includes...
 - a. Massage and Rolfing
 - b. Exercise and healthy eating
 - c. Meditation and spiritual practices
 - d. Herbal supplements for depression

4. Where can you go to find reliable information about CAM?
 - a. Wikipedia
 - b. www.nccam.nih.gov
 - c. The New York Times
 - d. Wall Street Journal

5. Osteoarthritis is an autoimmune disease.
 - a. True
 - b. False

6. Rheumatoid arthritis should be treated by a rheumatologist.
 - a. True
 - b. False

7. Conventional therapies for osteoarthritis include...
 - a. Meditation
 - b. Herbal Supplements

- c. NSAIDs and COX 2 inhibitors
 - d. Pranayama
8. Conventional therapies for rheumatoid arthritis include...
- a. Exercise programs
 - b. NSAIDs and DMARDs
 - c. Ginger and Turmeric
 - d. A and B
9. Turmeric contains _____, a chemical that is being investigated for its anti-inflammatory properties.
- a. Alkaloids
 - b. Curcumin
 - c. Gingerols
 - d. Acetaminophen
10. Tai Chi is being studied for these conditions...
- a. Irritable bowel syndrome
 - b. Hair loss
 - c. Rheumatoid arthritis and depression
 - d. Adolescent weight gain
11. Thunder God Vine can cause _____ when used for 5 years or more in some individuals.
- a. Edema
 - b. Nausea
 - c. Osteoporosis
 - d. Arthritis
12. Cat's claw is a vine grown in rainforest regions of South America and has been shown to inhibit...
- a. Osteophyte development
 - b. Cartilage damage
 - c. Weight gain
 - d. TNF alpha gene expression
13. Glucosamine and Chondroitin appear to be most effective for patients with...
- a. Gallbladder dysfunction
 - b. Moderate to severe pain
 - c. Mild to moderate pain

d. Arthritis

14. If more CAM continuing education opportunities were available would you be willing to incorporate this knowledge into your practice?

- a. Yes
- b. No
- c. Maybe
- d. I do not know

15. What types of CAM information are you most interested in receiving?

- a. CAM contraindications
- b. CAM/Drug interactions
- c. CAM Uses
- d. CAM utilization in the US.
- e. Other, please describe:

Glossary

Definitions adapted from the NCCAM website <http://nccam.nih.gov/health/atoz.htm>

Acupuncture: A major component of traditional Chinese medicine and one of the oldest health practices known. This practice involves the stimulation of specific points of the body with needles. Each needle is manipulated manually or with electricity. The purpose of this treatment is to balance the yin and yang (the two natural forces) within the body to create health.

Aromatherapy: This therapy utilizes essential oils of a variety of plants to stimulate the individual. Aromatherapy is used by many patients as a complement to conventional medical treatment for a variety of conditions including cancer, dementia, etc. Evidence does not support this treatments use as a cure but it is recommended as a supportive therapy to improve quality of life.

Ayurvedic Medicine: A whole medical system developed thousands of years ago in India. This is the life (ayur in Sanskrit) science (veda in Sanskrit) that accompanies the practice of yoga. This practice utilizes food, herbs, massage, physical activity and more to balance the individual body based on its specific constitution. There are three types of constitutional life forces or doshas that combine in different ratios to make up each person's constitution; vata (air, ether), pitta (fire and water), and kapha (water and earth). Ayurveda emphasizes lifestyle choices that enhance health.

Cats Claw: *Uncaria tomentosa* or *unicaria guainensis* are the two latin names for this woody vine. It is grown in Central and South America and thrives in rainforest settings. Its medicinal use dates back to the Incan population and is still used today. Traditionally cat's claw was used to prevent disease in general but also cancer, immune disorders, arthritis and to promote liver and kidney health. Research has been limited but small human studies have shown some use for this herbal treatment in osteo- and rheumatoid arthritis.

Chinese Thunder God Vine: Thunder God Vine or Lei gong teng is a perennial vine that grows in several Asian nations including China, Japan and Korea. Historical records show the medicinal use of this herb for more than 400 years. It has been used for inflammatory conditions as over active immune system issues, excessive menstrual periods, rheumatoid arthritis and other autoimmune conditions. Research, although limited, does support the use of this herbal treatment to decrease inflammation, suppress immune system and to fight cancer. More research is needed.

Chiropractic: Chiropractic is a commonly used practice that focuses on the structure and function of the body. The spinal column is frequently the primary focus. This hands on treatment gets its name from the Greek words cheir (hands) and praxis (action). The practice is based on the idea that the body has tremendous healing power when it is in balance an appropriately aligned. Practitioners in the United States must earn a Doctor of Chiropractic degree from a university or college accredited by the National Council on Chiropractic Education.

Chondroitin Sulfate: This dietary supplement is also complex carbohydrate that is found in

cartilage and helps the cartilage to retain fluids. Chondroitin is taken as part of a CAM arthritis treatment, glucosamine/Chondroitin sulfate and was investigated in the GAIT study through NCCAM.

Devil's Claw: A perennial plant native to Asian and Africa, devil's claw is commonly used for inflammatory disorders. The extract of this plant contain iridoid glycoside harpagoside, a chemical that aids in inflammation control by increasing eicosonoid biosynthesis. It is not recommended for people with gastrointestinal disorders. More research is needed to provide dosage and safety information. (21)

Glucosamine: This dietary supplement is, like Chondroitin, also a naturally occurring component of cartilage. It is an amino sugar that is produced and distributed by the body to cartilage and connective tissue. Its use as a dietary supplement and treatment for arthritis is being investigated in the GAIT study as well.

Ginger: Zingiber officinale is the latin name for this rhizome (underground stem). Ginger has been used by many cultures through history to treat a variety of health concerns. Typically it is used to treat nausea, GI distress, diarrhea and rheumatoid and osteoarthritis. The research suggests that it has short term effect on nausea, particularly for pregnancy. It remains unclear if ginger is effective as a treatment for any type of arthritis. NCCAM is supporting research examining gingers effect on the immune system, nausea for cancer patients on chemotherapy and inflammation.

Homeopathy: Homeopathic Medicine is one of the four types of whole medical systems recognized by NCCAM. It was developed in Germany by Samuel Hahnemann during the late 1700's and brought to the United States by Hans Burch Gram during the early 1800's. This system is based on the "like cures like" principle. Hahnemann observed that certain substances caused symptoms similar to different diseases and hypothesized that these substances might cure the disease whose symptoms they mimicked. This system has two other prominent principles; potentization (that as a substance is diluted in water and shaken vigorously at each step that it retains the therapeutic usefulness of the original substance), and that the treatment should be based on the individuals total health picture and not just the symptoms of a disease. This is a system that requires a trained practitioner to implement the treatments. Research has and continues to be conducted on this subject, results appear encouraging. Experts do caution that some of the solutions do contain more alcohol than conventional adult medications.

Magnets for Pain: As described in the introduction magnets are used to impact the energy fields of the body. Magnets are sold as jewelry, patches, shoe inserts and as additions to furniture such as mattresses. These devices are used by practitioners to treat a variety of health conditions such as headache, insomnia, GI issues, liver and kidney problems and other pain. During recent history magnets have been used for food, back and headache pain as well as arthritis and fibromyalgia. Research has delivered poor results but moor investigation is needed before conclusions can be drawn.

Massage Therapy: This practice is thousands of years old and shows up in some shape or form in all the regions of the world. It is the manipulation of the muscles and other soft tissues of the body to impact a change in condition. This is accomplished by the application of fingers, hands, forearms, elbows, and other tools at different locations and levels of pressure. This overarching name includes; Swedish, deep tissue, trigger point or neuromuscular therapy,

shiatsu and many other types of applications. Research has shown that massage can be effective for treating some conditions but it remains unclear the exact mechanism for this effect. NCCAM is sponsoring studies to answer questions surrounding this practice. Many states require that massage therapists be licensed and meet specific competencies.

Naturopathy: Naturopathic Medicine is another type of whole medical system recognized by NCCAM. This system while having its beginnings in 18th century Germany was named and popularized in the US by Benedict Lust. Lust experienced some of the primary treatments during his life in Germany during the late 1800s. Naturopathy is based on two primary beliefs; first that nature has healing power and second that living things have the ability to maintain or return to a state of balance or health. The treatments this system employs include; physical activities, herbal treatments, diet, exposure to sun and air and hydro therapy. The system is very prevention focused and considers the physician a teacher. Some states do require that Naturopathic Physicians or ND meet specific education requirements. Some treatments could be potentially harmful if not used under the direction of a qualified provider. There is research being conducted for many of the treatments used in this practice but little is currently available.

Reiki: A member of the biofield energy practices of CAM, Reiki originated in Japan. Its name is derived for the Japanese words rei (universal) and ki (life energy). Practitioners use very light touch or place hands a small distance from the person to energetically facilitate the individuals own healing. The practitioner's goal is to access their own life energy to aid the client's healing. Each hand position is held for 2 -5 minutes before moving on. Reiki appears to be generally safe and a pleasant experience for the recipients. Currently there is no regulation of reiki practitioners. NCCAM research is exploring the possible reasons for its effect, its use for fibromyalgia, CVD, anxiety and quality of life for people with advanced AIDS.

Salix or Willow Family: This family of plants is the source of one of the first plant to drug developments. Salix family was used to develop salicylic acid and aspirin. This salicin content is exactly what makes this group of plants an interesting treatment for inflammatory and chronic pain conditions. The primary criticism of these products is the high cost in comparison to aspirin. (RA1)

SAMe: S-adenosyl-methionine is a coenzyme that is involved in methyl group transfers in bodily chemistry. It is also a popular dietary supplement. Currently NCCAM is supporting research that evaluates its effectiveness in several conditions; osteoarthritis, depression and liver disease.

Tai Chi: A mind body practice that originated in China during the 13th century, Tai Chi is thought of as an internal martial art. Legend has it that Taoist monk developed a practice of thirteen exercises that mimic the movements of animals. He also incorporated meditation and internal force concepts into the practice. Tai chi is based on yin and yang (the opposing forces in the body) and qi (the universal energy). A regular practice of the slow sustained exercises and breathing is reported to lead to a balance between the opposing forces leading to improved health. NCCAM is sponsoring research looking into Tai Chi's impact on a number of conditions including; bone loss, depression, fibromyalgia, osteoarthritis, chronic heart failure and rheumatoid arthritis.

Traditional Chinese Medicine: This is the fourth of the whole medical systems recognized by NCCAM. TCM originated in China thousands of years ago and has developed into the system

used today. Practitioners treat a variety of conditions with herbs, acupuncture and other treatments. This system is designed to balance the yin and yang (opposing forces in nature) and balance the flow of chi through the body to alleviate disease. NCCAM is supporting research into Chinese herbal therapies for a variety of conditions like diabetes and heart disease and acupuncture for the treatment of arthritis, back pain and depression.

Turmeric: This shrub is related to ginger and is grown in Asia and Africa. The Latin name is *Cucuma longa*. It is known for its distinct golden yellow color and its use in curry and as a fabric dye. Medicinally it has been used to help with digestive and liver issues, arthritis pain and to regulate menstruation. Preliminary research suggests that the active chemical curcumin in turmeric may have anti-inflammatory and anti-cancer effects. Additional research is required to draw conclusions.

Yoga: This mind body practice originated in India more than five thousand years ago. This practice combines physical postures (asanas), breath work (pranayama), meditations and philosophy. Traditional yoga governed moral habits, health habits, physical postures, breath work, a sense of withdrawal, concentration, contemplation and higher consciousness. In the US yoga is very popular but is not usually practiced on all of these levels. Physical postures, breath work and meditation are the primary activities of modern American yoga. The term yoga is the Sanskrit word meaning union or yoke. The goal of this practice is to balance the mind, body and spirit, to improve relaxation and to create mindfulness. Yoga is generally considered safe; however, those with medical conditions should consult their physician before beginning the practice. NCCAM is supporting a number of studies looking at yoga's impact on blood pressure, low back pain, COPD, depression, immune functions, arthritis, insomnia and more.

CAM Quick Reference Chart

<i>Common Name</i>	<i>Common Indication</i>	<i>Side Effects</i>	<i>Cautions</i>
Acupuncture	Relief or prevention of pain and other health conditions	Generally few side effects if proper needles and sterilization methods are used	Seek a qualified practitioner with safe sterilized needles
Anti-inflammatory Diet	Inflammation and arthritic condition	Elimination of food groups may be problematic for some individuals	A balanced diet with moderate portions is recommended
Cat's Claw	Inflammatory conditions such as rheumatoid or osteoarthritis	Generally rare but may include dizziness, headaches and vomiting	Women who are pregnant should avoid this treatment
Chondroitin	Arthritis	Generally rare and mild but may include upset stomach	Those with allergies to fish should avoid this supplement
Devil's Claw	Inflammatory conditions	Not recommended for those with gastrointestinal disorders	Parts of this plant are poisonous and quite dangerous if not prepared by a knowledgeable

			practitioner.
Fish Oil	Inflammation, HTN, Cholesterol, CVD and more	May cause increased bleeding when taken in conjunction with anti clotting drugs	Some sources may contain contaminants such as mercury
Ginger	Prevention of nausea, vomiting, diarrhea and indigestion. Inflammatory conditions	Generally few side effects but may cause indigestion, heart burn or gas with large doses	Large doses of powdered ginger may cause nausea
GLA	Inflammatory conditions	May cause increased bleeding when taken in conjunction with anti clotting drugs	Borage seed, one of the sources can contain chemicals in small quantities that may be liver toxic.
Glucosamine	Arthritis	May cause upset stomach Not recommended for people with shellfish allergies	People with cardiovascular and circulatory disorders should consult their physician before using.

Glucosamine/Chondroitin	Arthritis	May cause upset stomach Not recommended for people with shellfish and fish allergies	People with cardiovascular and circulatory disorders should consult their physician before using.
Hydrotherapy	Inflammation	Generally regarded as safe	Those who may have circulatory issues or who may have issues with drastic changes in temperature should avoid without a physicians recommendation
Mind Body Medicine	Variety of conditions, used to connect the mind , body and spirit	Generally regarded as safe	N/A
SAMe	Osteoarthritis, Depression and Liver Disease	Still being Studied	Not yet conclusive
Thunder God Vine	Inflammation or overactive immune	Bone demineralization with long term use and	Parts other than the skinned root can be

	system	possible decreased sperm count	poisonous
Turmeric	Anti-inflammatory and antioxidant activity of plant	Generally mild but may include indigestion	People with gallbladder disorders should avoid this treatment

This information derived from the NCCAM.nih.gov website and the references in parentheses.

With any complementary and alternative medicinal practices, please inform your physician that you are or intend to use them. This will help to give a full picture of your health and treatments.

Compiled July 2009

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References

1. Bhatt N, Pushpangadan P, Warude D, Patwardhan B. Ayurveda and traditional Chinese medicine: a comparative overview. *Evidence-based complementary and alternative medicine*. 2005;2(4):465-473.
2. Brismee J-M, Paige RL, Ming-Chien C, Boatright JD, McCaleb JA, Quintela MM, Du F, Xu KT, Chwan-Li S. Group and home-based tai Chi in elderly subjects with knee osteoarthritis: a randomized controlled trial. *Clinical Rehabilitation*. 2007;21(2):99-111.
3. NCCAM. *Rheumatoid Arthritis and complementary and Alternative Medicine* September 2005.
4. National Cancer Institute. Aromatherapy and Essential Oils. Webpage. Available at: www.cancer.gov/cancertopics/pdq/cam/aromatherapy/patient. Accessed June 12, 2009
5. Kehr W. Cancer Tutor. <http://cancertutor.com/Cancer/RawFood.html>. Accessed June 1, 2009.
6. NCCAM. *CAM Basics*: National Institutes of Health, National Center for Complementary and Alternative Medicine; February 2007.
7. NCCAM. *Whole Medical Systems: An Overview*: National Institutes of Health, National Center for Complementary and Alternative Medicine; October 2004.
8. NCCAM. *Mind-Body Medicine: An Overview*: National Institutes of Health, National Center for Complementary and Alternative Medicine; October 2004.
9. NCCAM. *Massage Therapy as CAM*: National Institutes of Health, National Center for Complementary and Alternative Medicine; September 2006.
10. Fritz S. *Mosby's Fundamentals of Therapeutic Massage*. Second Edition ed. St. Louis, Missouri: Mosby's Inc.; 2000.
11. NCCAM. *Magnets for Pain* National Institutes of Health, National Center for Complementary and Alternative Medicine; March 2008.
12. Rees R, Harris P. The prevalence of complementary and alternative medicine use among the general population: a systematic review of the literature. *Complementary Therapies in Medicine*. 2000;8(2):88-96.
13. NCCAM. *The Use of Complementary and Alternative Medicine in the United States*: National Institutes of Health, National Center for Complementary and Alternative Medicine; December 2008.
14. NCCAM. *Tai Chi: An Introduction*: National Institutes of Health, National Center for Complementary and Alternative Medicine. June 2006.
15. Cohen KS. *The Way of Qigong*. New York, NY: Ballentine Books; 1997.
16. Ernst E, Izzo AA. Interactions between herbal medicines and prescribed drugs: a systematic review. *Drugs*. 2001; 61(15):2163-2175.
17. Bourguignon C, Taibi D. The role of complementary and alternative therapies in managing rheumatoid arthritis. *Family & community health*. 2003;26(1):41-52.
18. National Institutes of Health NCCAM. Osteoarthritis. May, 2006; web publication. Available at: www.niams.nih.gov/Health_Info/Osteoarthritis/default.asp. Accessed May 26, 2009

19. Sniezek J, DeVellis R, Sloane P, Sleath B, Currey S, Xiao C, Brady T, Mielenz T, Wiley-Exley E, Callahan L. Use of complementary and alternative medicine among patients with arthritis. *Preventing chronic disease*. 2009;6(2):A44.
20. NCCAM. *Thunder God Vine*: National Institutes of Health, National Center for Complementary and Alternative Medicine. October 2007.
21. Sigal L, Setty A. Herbal medications commonly used in the practice of rheumatology: mechanisms of action, efficacy, and side effects. *Seminars in arthritis and rheumatism*. 2005;34(6):773-784..
22. Hardin S. Cat's claw: an Amazonian vine decreases inflammation in osteoarthritis. *Complementary therapies in clinical practice*. 2007;13(1):25-28.
23. Gonzales G, Valerio L. Toxicological aspects of the South American herbs cat's claw (*Uncaria tomentosa*) and Maca (*Lepidium meyenii*) : a critical synopsis. *Toxicological reviews*. 2005;24(1):11-35.
24. NCCAM. *Acupuncture: An Introduction*: National Institutes of Health, National Center for Complementary and Alternative Medicine. December 2007.
25. Sandoval M, Miller MJ, Okuhama NN, Bustamante SA, Rodriguez Z, Piscocoya J. Efficacy and safety of freeze-dried cat's claw in osteoarthritis of the knee: mechanisms of action of the species *Uncaria guianensis*. *Inflammation Research*. 2001;50(9):442-448.
26. Hochberg M, Gilpin AMK, Lee W, Langenberg P, Lao L, Berman B. Effectiveness of acupuncture as adjunctive therapy in osteoarthritis of the knee: a randomized, controlled trial. *Annals of Internal Medicine*. 2004;141(12):901-910.
27. Clegg DO, Reda DJ, Harris CL, Klein MA, O'Dell JR, Hooper MM, Bradley JD, Bingham CO, 3rd, Weisman MH, Jackson CG, Lane NE, Cush JJ, Moreland LW, Schumacher HR, Jr., Oddis CV, Wolfe F, Molitor JA, Yocum DE, Schnitzer TJ, Furst DE, Sawitzke AD, Shi H, Brandt KD, Moskowitz RW, Williams HJ. Glucosamine, chondroitin sulfate, and the two in combination for painful knee osteoarthritis. *The New England Journal Of Medicine*. 2006;354(8):795-808.
28. AHRQ. S-Adenosyl-L-Methionine for Treatment of Depression, Osteoarthritis and Liver Disease: Southern California Evidence-Based Practice Center 2002. 64.

Post Project Survey

Thank you for taking part in this project. The answers to the following survey questions will be used to improve the current chapter and to develop future chapters. If you are interested in the completed project, it will be posted at www.eatbreathebewell.com by mid August 2009.

1. Please select the answer that best describes the number of years you have been in practice as a dietitian.
 - a. 0-1
 - b. 2-5
 - c. 6-10
 - d. 11-20
 - e. 21+
2. Please select the answer that best describes your practice setting.
 - a. Urban
 - b. Rural
 - c. Suburban
3. Are you male or female?
 - a. Female
 - b. Male
4. Please select the decade that best describes your age.
 - a. 20s
 - b. 30s
 - c. 40s
 - d. 50s
 - e. 60s
 - f. 70s
 - g. 80s +
 - h. Other: Please describe: _____
5. Please select the answer that best describes your race.
 - a. White
 - b. Black/African American
 - c. Asian
 - d. American Indian/Alaskan Native
 - e. Hawaiian/Pacific Islander

- f. Other: Please describe _____

6. Would you describe yourself as Hispanic or Latino(a)?
- a. Yes
 - b. No
7. Are you employed outside the home?
- a. No
 - b. Yes; Part time
 - c. Yes; Full time
8. How would describe your area of practice?
- a. Clinical (in patient)
 - b. Out patient
 - c. Community
 - d. Private practice
 - e. Other: (Please describe)
- _____
9. Do you currently have clients who use complementary and/or alternative medical therapies?
- a. Yes
 - b. No
 - c. Don't know
10. Was this chapter useful for your professional practice?
- a. Yes
 - b. No
11. Was this chapter useful to you personally?
- a. Yes
 - b. No
 - c. Please Describe:
- _____
12. Did you read the suggested articles?
- a. Yes
 - b. No
13. Which chapter component was the most useful?
- a. Chapter
 - b. Glossary

- c. Chart
- d. Articles
- e. Other, please describe:

14. Which chapter component was the least useful?

- a. Chapter
- b. Glossary
- c. Chart
- d. Articles
- e. Other, please describe:

15. What changes would you recommend for this chapter? Please describe:

16. Which topic would you be most interested in for the next chapter?

- a. Menopause
- b. Gastrointestinal diseases like Irritable Bowel Syndrome
- c. Chronic pain
- d. Weight loss
- e. Other, please describe:

17. Any other comments?

Thank you