

**Yoga Therapy for the Management of Hot Flashes, Depression and  
Anxiety during the Perimenopause**

by

**Tiana Blackburn**

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Yoga Therapy for the Management of Hot Flashes,  
Depression and Anxiety during the Perimenopause

A Master's Project by

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Antioch University Santa Barbara

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In Partial Fulfillment of the Requirements for the Degree of  
Master of Arts in Psychology  
with a Concentration in Integrative Yoga

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## TABLE OF CONTENTS

|   |    |
|---|----|
| Abstract.....                               | 3  |
| I. Introduction.....                        | 4  |
| II. Problem Statement.....                  | 9  |
| III. Perimenopausal Symptoms.....           | 11 |
| A. Perimenopausal hot flushes.....          | 11 |
| B. Perimenopausal depression.....           | 14 |
| C. Perimenopausal anxiety.....              | 19 |
| D. Perimenopause and physical activity..... | 22 |
| IV. Principles of Ayurveda.....             | 26 |
| A. Theory of Koshas.....                    | 27 |
| B. Theory of Doshas.....                    | 30 |
| C. Yoga Therapy.....                        | 35 |
| V. Ayurvedic Yoga Intervention.....         | 38 |
| A. Workshop outline.....                    | 38 |
| B. Asana guidelines.....                    | 40 |
| C. VPK classes.....                         | 42 |
| a. Classes to balance Vata.....             | 42 |
| b. Classes to balance Pitta.....            | 44 |
| c. Classes to balance Kapha.....            | 48 |
| VI. Summary.....                            | 50 |
| VII. Discussion.....                        | 54 |

## ABSTRACT

This project defines the intervention of yoga therapy for perimenopausal symptoms of hot flushes, anxiety, and depression according to the principles of Ayurveda. This is important in light of research showing the costs versus the benefits of hormone replacement therapy (HRT), and the growing population of hormone users as the lifespan increases. The research shows that there is a basis for effective alternatives to HRT for women who cannot or choose not to supplement estrogen levels using pharmaceutical hormones. Ayurveda offers a diagnostic approach that includes consideration of a woman's individual constitution as a predisposing cause of menopausal symptoms. Through questionnaire and pulse diagnosis, a woman may determine her body type and be provided guidelines unique for her constitution. The intervention consists of an educational workshop and follows up with a yoga practice. The practice facilitates the perception of control, while encouraging surrender to the transition of perimenopause.

## **Introduction**

As a woman enters the climacteric in her life cycle, she may experience hot flushes, anxiety, or depression that may be associated with a change in sleep patterns, irritability, or difficulty in daytime functioning. The climacteric is the entire transitional phase in the life span during which a woman gradually moves from being reproductive to non-reproductive, and includes perimenopause, menopause and postmenopause.

Perimenopause can occur anytime between 40 to 50 years of age (Lobo, 1997). Estrogen levels gradually decrease from around age 35 during normal menstrual functioning, leading eventually to an inability to conceive. According to Lobo, it is the last six months before menopause that the major reduction in ovarian function occurs (Lobo, 1997).

Menopause marks the cessation of menses and post menopause is the time after reproductive capability ends. Because unexpected ovarian activity can occur briefly following menopause, the post menopause is said to begin approximately one year after the last menstrual event (Lobo, 1997). The symptoms of the climacteric are a reflection of a fluctuating hormonal system known to result in stressful, age-related changes.

Age-related changes due to lower estrogen levels have been linked to osteoporosis and heart disease (Grady, 1992) because estrogen preserves bone mass (Eskin, 2000) and protects the heart. As a result medical professionals believe the loss of estrogen production by the ovaries is a disease process (Sobel, 1996). Sobel suggests that menopause is pathological and should be called “Maturity Onset Ovarian Deficiency State, i.e., MOODS” (Sobel, 1996). Sobel describes MOODS as an abnormality where there is destruction or atrophy of an endocrine organ, with a decrease in hormone secretion resulting in life-threatening disorders (cardiovascular disease, for example) that

can be corrected by hormone replacement therapy. Sobel states that if proper medical terminology were to be used instead of the term menopause, women who suffer needlessly could be diagnosed as being in an endocrine deficiency state, and could then be treated with hormone replacement. He fails to address the fact that estrogen is produced by other glands in the body besides the ovaries, and that ovaries continue to produce additional hormones such as testosterone (Ala-Fossi, Maenpaa, Aine, & Punnonen, 1998). Sobel's argument may support a diagnosis of hormone deficiency, but it also implies that ageing is a disease process instead a normal part of the life cycle.

Although lower levels of ovarian estrogen may be correlated with age-related diseases, it does not necessarily mean that the menopausal transition itself is a disease process. The meaning of menopause as experienced by American women is diverse just as the experience of it varies in complexity from woman to woman (George, 2000). For some women it is a growth in liberation as they work through the confusion of it. Coming out of it can be a rebirth experience after the emotional turmoil of it, while for others the symptoms are hardly noticed and can be uneventful, requiring no intervention. Although the fifteen women in George's study experienced menopause as a normal part of the life cycle and for the most part unremarkable, they were relieved to become postmenopausal (George, 2000). The view that the menstrual cycle and menopause are transitional and potentially positive, life-affirming experiences is supported by Ayurveda, a system of knowledge that has roots in ancient vedic literature. The literal translation of the Sanskrit word Ayurveda is derived from two roots, ayur , meaning life, and veda, meaning knowledge (Lad, n.d.). Ayurveda is known today as a science of life that encompasses the body, mind, and spirit, and which views the symptoms of menopause as

simply an imbalance of bodily humors. What this project offers is an intervention using therapeutic yoga according to Ayurvedic principles for the management of symptoms.

The literature was reviewed for hot flushes, anxiety and depression experienced throughout the climacteric but especially during perimenopause. An equivalent amount of data was found for perimenopausal depression as for post menopausal depression, but since the causes of depression during the phases of the climacteric may differ, this project will focus primarily on the relationship between hot flushes and psychological symptoms during the perimenopause.

Hot flushes and psychological symptoms were studied in light of the research on locus-of-control. Locus-of-control studies refer to the perception of internal control versus the perception of external control. Where does the woman locate control of her symptoms and how important is that? One of the feelings expressed in interviews with women was anxiety over the sense of having no control over hot flushes (George, 2000). It is not surprising that perimenopausal women have less of a sense of control over their own bodies than premenopausal women (Kroll, 1989), and while our knowledge of the specific variables accounting for this difference is inconclusive, some variables that affect locus of control according to Kennedy (1998) include major life stressors and the reasonability of controlling symptoms.

It is known that the way a woman appraises hot flushes, and the strategies she uses to cope, affect her psychological state depending on the perception she has of her ability to control her symptoms (Reynolds, 1999). In this regard, Kroll states, "It is conceivable that women experiencing more symptoms perceived less internal control relating to menopause, and that those who perceived less internal control reported more



symptoms...women who engage in the general, health-conscious preventive strategies perceived greater control over their menopause than women who utilized few strategies” (Kroll, 1989, p. 65).

It is no surprise that women who use alternative therapies often cite a desire for personal control as important (Seidl & Stewart, 1998). With the perception that symptoms can be controlled, leading to useful strategies such as diet and lifestyle changes, many women experience fewer symptoms. This is an example of an internal locus-of-control, whereas other women who turn to the physician to control their symptoms usually end up taking HRT, which is an example of an external locus-of-control.

For women who desire an alternative to HRT, the practice of yoga is useful in developing this internal locus-of-control. Some of the aspects of yoga are inward focus and inward concentration during practice of balancing poses and stretches that increase flexibility. Using the postures and deep rhythmical breathing, the restraint of senses, concentration, and meditation that form the basis of yoga practice, Vahia and colleagues found significant improvement for anxiety and depression (Vahia, Doongaji, Jeste, Ravindranath, Kapoor, & Ardhapurkar, 1972). Vahia et al. state that healthy functioning should be guided by integrating mechanisms within the individual, another example of internal locus-of-control, especially in the absence healthy stimuli from the external environment.

The psychological basis of yoga is different from most western approaches with the exception of transpersonal psychology. Compiled by Patanjali near 200 C.E. (Muskin, 2000) the yoga sutras state that the ultimate source of human suffering

originates in the erroneous belief in an individual body-mind, separate from all others and solely motivated by the pleasure-pain principle. The purpose of yoga is to detach from the endless fluctuations of pleasure and pain of everyday existence, and reduce physiologic reactivity to any given external or internal stimuli. The physical postures increase control over voluntary muscles and work off stress hormones accumulated in the body; pranayama, or breathing exercises, improve control over the autonomic nervous system; pratyahara, or sense withdrawal, reduce sensory stimuli; and meditation increases self-awareness and insight into thought patterns and habits (Muskin, 2000).

The discipline of yoga is practiced in many ways: as a health science, as a spiritual discipline, for curative purposes, as a psychotherapeutic discipline, as a philosophical system, and as a system of psychology. Recent surveys to determine the future development of yoga in India reflect a trend towards the study and practice of yoga as a branch of medicine that is favored among Ayurvedic physicians, medical doctors, and philosophers although some yoga experts still regard it as separate from Ayurveda (Mishra, 1997). Ayurveda complements yoga because it offers a perception of the climacteric as a seasonal transition. According to Svoboda (1999) the general Sanskrit term for the menstrual cycle is “artarva”, a word that is derived from “rtu”, meaning season. Whenever the seasons change, whether it is environmental or the season of one’s life, we adapt, and when we do that poorly we open up to the possibility of disease. Ayurveda offers the purificatory and palliative therapies to help with seasonal changes, while yoga, having developed separately from Ayurveda yet showing historical similarities (Feuerstein, 1998), can be practiced in a way that supports each woman’s individual constitution according to Ayurvedic principles.

## **Problem Statement**

This project is important because the number of U.S. women in the climacteric will almost double between 1990 and 2020 (U.S. Bureau of the Census, 1977), and they represent a very large market of potential users of hormone replacement therapy (HRT). Thirty eight percent of postmenopausal women in the US between the ages of 50 and 74 are taking hormones (Keating, Cleary, Rossi, Zaslavsky, & Ayanian, 1999). This is of concern in light of the International Position Paper on Women's Health and Menopause that was recently presented to the National Institute of Health (NIH). In that report, scientists express their doubts that hormone replacement therapy (HRT) can prevent heart disease, severe depression, urinary incontinence and broken bones caused by osteoporosis (Grady, 2002).

On the other hand, HRT for hot flushes is known to be beneficial on a limited basis. Hlatky and colleagues found that women experiencing hot flushes improved in mental health and their depression lessened as a result of taking HRT (Hlatky, Boothroyd, Vittinghoff, Sharp, & Whooley, 2002). MacLennan (2002) also showed a significant reduction in weekly hot flush frequency for HRT users (up to 77%) with severity reduced. The number of women who withdrew from HRT because of the side effects of breast tenderness, edema, joint pain and psychological symptoms was only marginally more than women who were taking a placebo. In clinical practice, these symptoms would have been addressed by tailoring HRT usage in a way that the clinical trials could not do. The study concluded that HRT is highly effective in alleviating hot flushes and night sweats even though women in the control group taking a placebo experienced a 50% reduction in hot flushes also. This was attributed to a natural decline

of hot flushes over time, or an increased understanding that resulted in relief of anxiety, or possibly that women self-recorded their symptoms differently, nevertheless it indicates there are other reasons besides HRT for reduction of hot flushes.

In the editorial section of the Journal of the American Medical Association it was said recently that HRT for postmenopausal women is not a cause for celebration (Rexrode & Manson, 2002). Women taking HRT to prevent age-related diseases in the *absence* of hot flushes experience significant decline in physical function, mental health and energy/fatigue levels while their depression remains unchanged (Hlatky, Boothroyd, Vittinghoff, Sharp, & Whooley, 2002). Another problem associated with HRT is its relationship to breast cancer of a particular type, namely lobular tumors. The data shows that recent long-term use of HRT is associated with an increased risk of this type of breast cancer (White, 2002). The data also suggest that HRT is contraindicated for women who have a history of heart disease. The risk for recurrent major coronary events seems to increase among short-term hormone users with previous coronary disease even though it decreases with longer-term use (Grodstein, 2001). Either in the presence of HRT for hot flushes, or in its absence because of risk factors, there are alternatives such as Ayurvedic yoga that will have a positive effect on women during the climacteric.

In reviewing the literature, there was an obvious gap between the subjects of yoga and menopause, therefore the keywords used in conducting the literature review were “physical activity” and “exercise” in relation to menopause, anxiety, depression, and hot flushes. The first section of this literature review discusses the symptoms of perimenopause, which research shows is positively affected by physical activity (Suling, Holm, Gulanick, Lanuza, & Penckofer, 1999). This supports the argument that yoga,

being a form of physical activity that can also be viewed as exercise, will be beneficial to manage hot flushes, anxiety, and depression. The latter section of this project discusses the practice of yoga therapy in more detail and provides the intervention.

### **Perimenopausal Symptoms**

**Perimenopausal hot flushes.** The majority of studies reviewed by J. G. Green were in agreement that hot flushes and night sweats are the most common vasomotor symptoms observed that can be directly associated with estrogen changes (Green, 1998). Other somatic symptoms include pressure or tightness in the head or body, muscle and joint pains, numbness or tingling, headaches, feeling dizzy or faint, breathing difficulties and/or loss of feeling in hands or feet (Green, 1998). These somatic symptoms may or may not be related to hormones although they were observed while studying hot flushes. In Kronenberg's study on vasomotor symptoms in the perimenopause (Lobo, 1997) hot flushes are a sensation of heat in the upper body, often accompanied by sweating that can be cold, and a pounding heart. Hot flushes vary in frequency and intensity from mild to extreme, lasting usually 3-5 minutes. The normal amount of time that a woman may experience hot flushes is approximately 6 months up to 2 years, but for some women they last many years well into post menopause (Lobo, 1997). Until recently, there has been very little known about how to reduce the frequency of hot flushes or how to prevent them.

It has been shown that increased levels of physical activity do not prevent hot flushes. Athletic women such as runners often have lower levels of estrogen, which actually increases their frequency of hot flushes (Sternfeld, Quesenberry & Husson, 1999). Still, physical activity is very beneficial for women, in fact, it is almost essential

during perimenopause because it does reduce somatic and vasomotor symptoms immediately following exercise, and improves mood (Slaven & Lee, 1997).

Meanwhile one wonders if there isn't some form of physical activity that would control hot flushes. It could be that because there are qualities that make hatha yoga different from other forms of exercise, yoga may provide an answer. Yoga appears to have been devised to specifically rehabilitate the various organs and the endocrine glands, which do not appear to be affected by vigorous exercise in the same way (Mishra, 1997). Mishra (1997) states "the basic difference between vigorous physical exercise and yogic exercise appears to be the involvement of energy production (rehabilitation) and energy utilization mechanisms...the muscles cannot recover the amount of energy consumed in vigorous exercise and they become fatigued. In yogic exercise there is a synchronized break down and recovery of energy, which ultimately enhances the physiological efficiency of the muscle tissue without its unwanted hypertrophy" (p.99).

Yoga postures emphasize the alignment of bones to create optimal flow of energy while stretching the muscles to help support this alignment. David Frawley, director of the American Institute of Vedic Studies, says yoga "keeps the spinal column subtle in order to create the optimal flow of energy through the nerves that enervate the organ and glandular systems...[asanas] begin a systematic cleansing of the tissues...asanas are not merely exercise in classical yoga, but are used to settle the body for breathing practices and meditation that awakens vital energy called prana" (Frawley, 1999, p. 205). These breathing practices may be the key to reducing hot flushes.

For women who cannot tolerate hormone replacement therapy, deep breathing and progressive muscle relaxation similar to that used in yoga **has** been shown to be a

useful treatment alternative for the reduction of hot flushes (Freedman, 1992). In Freedman's study, 33 women with frequent menopausal hot flushes were randomly assigned to receive eight sessions of training in paced respiration or muscle relaxation, while electroencephalographic biofeedback was used as a placebo control. Their hot flushes were objectively measured by use of disposable silver-silver chloride electrodes filled with potassium chloride paste attached over the sternum. This allowed researchers to monitor women even during sleep through the use of a recorder with a constant voltage circuit. The recordings were transferred through an analog-to-digital converter to a computer that was programmed to detect any sternal skin conductance level increases previously demonstrated as an objective definition of a hot flush. It was shown that women who received paced respiration training significantly reduced their frequency of hot flushes, increased their tidal volume, and slowed their respiration rates regardless of muscle relaxation. The data suggested that elevated central sympathetic activation of the nervous system appears to be involved in the initiation of hot flushes. Deep breathing of a rhythmical nature appears to modulate the sympathetic nervous system, which alone could result in a significant reduction of menopausal hot flushes.

Freedman (1999) followed up the earlier study to show that most menopausal hot flushes are preceded by small elevations in core body temperature. The study replicated sweating thresholds using exercise. The body was then cooled to determine the shivering threshold of women who experienced hot flushes. The thermoneutral zone between the thresholds for sweating and shivering was reduced in women with hot flush symptoms, and they concluded that menopausal hot flushes could be triggered by small elevations in body temperature. For yoga teachers, this shows that it becomes important to assess the

extent to which a asana practice might be stressful for perimenopausal women who are experiencing hot flashes. Women who did not experience hot flashes had a wider threshold for sweating and shivering and could tolerate more heat.

Since hot flashes occur most frequently when the body's core temperature is highest (Lobo, 1997), it is important to maintain slow, deep breathing during a strong, flowing asana practice where the body's core temperature is heated up, just as during a hot flush. It is important to realize that an asana practice might be stressful for perimenopausal women when ambient room temperature is increased to prevent muscle soreness and to aid flexibility. Because hot flashes were more frequent and intense in warm temperatures (31 degrees C.) as compared to cool (19 degree C.) temperatures (Lobo, 1997), the ambient temperature of an asana room should be controlled to prevent a hot flush in symptomatic women.

**Perimenopausal depression.** If deep breathing can help a woman manage hot flashes and even decrease their frequency, then it may also be helpful for the other two most common symptoms associated with the climacteric, anxiety and depression. The practice of rhythmical breathing, or pranayama as it is called in yoga, improved clinical depression when performed daily for thirty minutes over a 3-month period (Naga Venkatesha Murthy, Janakiramaiah, Gangadhar, & Subbakrishna, 1998). Also, Miller and Kabat-Zinn (1995) demonstrated that mindfulness meditation has long-term beneficial effects in the treatment of people with anxiety disorders. Breathing and meditation are both components of a well-rounded yoga practice, which is different from yoga practiced as a form of gymnastics, and they may possibly alleviate depression correlated with vasomotor symptoms.



It may be that lack of sleep is the connection between hot flushes and mood changes, but a direct cause and effect relationship between hot flushes and depression has not been established. Caspar (1998) finds that linking depressive episodes directly to lowered estrogen levels or hot flushes is inconclusive, even while recognizing that psychological distress may accompany hormonal fluctuations. Nevertheless, depressed mood may be related to night sweats according to Luaritzen and van Keep (Lobo, 1997) when night sweats cause sleep deprivation. Baker, Simpson and Dawson (1996) had found that the sleep of perimenopausal women was significantly disrupted and was correlated with higher anxiety, yet their study did not specifically address night sweats as the cause of disrupted sleep. But it appears that psychological symptoms resulting from disturbed sleep can be **indirectly** related to hot flushes or night sweats. Since yoga helps to reduce hot flushes through deep breathing, it could also enhance sleep and may result in improved mood.

It is necessary to make a distinction between depressed mood and depressive disorder according to Gath (1998) when correlating depression with menopausal symptoms. Gath's definition of depressed mood is familiar sadness, low spirits, or despondency, and its lack of distinction from depressive disorder, which is a more serious syndrome, could make it difficult to interpret (Gath, 1998). Clinical depression during the climacteric is often related to a pre-existing major mood disorder. The measurement scales in most of the research on menopausal depression evaluated depression using the Beck Depression Inventory (BDI) and the Hamilton Rating Scales of Clinical Anxiety and Depression (Greene, 1998). The use of these scales in the studies makes it difficult to distinguish between depressive disorder with depressed mood.

In the case of depressive disorder, a history of mood disorder may affect the reaction to perimenopausal symptoms. Tam and colleagues (1999) demonstrated that perimenopausal women had higher scores of depression on the BDI than pre- or postmenopausal women and attributed the scores to a prior history of mood disorder (Tam, Stucky, Hanson, & Parry, 1999). The DSM-IV criteria for major depression says that five of the following symptoms must be present in the same 2-week period: depressed mood most of the day, diminished interest or pleasure, weight loss, insomnia, psychomotor retardation, fatigue, feelings of worthlessness or excessive guilt, diminished ability to concentrate or indecisiveness, and recurrent thoughts of death. These symptoms would be clinical if they caused impairment in social, occupational, or other important areas of functioning, and could not be accounted for by bereavement, drug use or a general medical condition.

Beck (1967) states the development of depressed mood depends on the negative attitude one develops of oneself, the outside world, and one's future based on one's experiences. Because of negative attitudes, one becomes especially sensitive to stress. If women respond to the loss of reproductive ability with ideas of personal deficiency, it may lead to a negative attitude about menopause. Depression then becomes a symptom of perimenopause and is not a result of some other major life stressor. In depression the cognitive pattern, or schema, is negative in regards to a person's health, worth, performance, personality or their expectations of the future. Negative schemas are not necessarily going to manifest *because* of a hot flush, but women with pre-existing mood disorders may be especially sensitive to the stress of perimenopause.

A prior history of mood disorder is only one example in which depression may be related to menopause, and there are several other possibilities. A second way that depression may be related to menopause is psychosocial. A Turkish study (Sagsoz, Oguzturk, Bayram, & Kamaci, 2001) found no correlation between blood hormone or lipid levels and anxiety or depression, but did find that depression was higher in women that had born children than in those that had not born children. In contrast to North American studies showing a higher prevalence of depression during perimenopause, Sagsoz and colleagues state that depression is higher among postmenopausal women due to the correlation between childbearing and depression. They found that depression was higher among women who had born children than among those who had not born children. Psychosocial causes include the sense of loss that mothers feel when their children leave home, or the way a woman feels about herself regarding her value to society as a non-reproductive woman. This may be a result of specific cultural values and would be exacerbated by the loss of social support or family role changes. This type of depression contrasts depression associated with night sweats and sleep deprivation, or even a cyclical depression.

Stressful hot flushes and negative expectations about menopause are most likely predisposing factors to depressed mood. Since pessimism about the future is a key factor of anxiety and depression (MacLeod, Tat, Kentish, Carroll, & Hunter, 1997), women should be educated to view menopause through a positive schema, in other words a spiritual perspective such as that found in yoga psychology. In yoga therapy, positive thoughts reflecting feelings of gratitude, self-love, and forgiveness should be encouraged as part of the process of surrendering to the transition of menopause. These might be

included during the final relaxation pose of the asana practice called Shavasana, which has been shown to effectively alleviate depression in female students (Khumar, Kaur, & Kaur, 1993).

Another way that depression might be related to menopause is biochemical. Some researchers believe that a decline in estrogen leads to biochemical changes in the brain that lead to mood changes (Lobo, 1997). Research indicates that mood changes are related to hormone levels throughout the life cycle, also known as pre-menstrual syndrome (PMS). Comparisons have been made between the pathophysiology of depression and the neurobiologic effects of estrogen. Avis (Lobo, 1997) says it this way:

“The pathophysiology of depression is thought to involve the dysregulation of several neurotransmitters and neuromodulatory systems: serotonergic, noradrenergic, cholinergic, dopaminergic, and  $\gamma$ -aminobutyric acid (GABA)... the neurobiologic effects of estrogen are thought to include decreased monoamine oxidase activity...the enhancement of serotonin neurotransmission, the enhancement of cholinergic transmission, antipodaminergic effects, the modulation of GABA receptors, a decrease of beta-endorphin function, the modulation of progesterone receptors, and the modification of sleep and circadian rhythms...estrogen is thought to enhance serotonergic transmission by decreasing monoamine oxidase activity, increasing free tryptophan availability to the brain, and enhancing the transport of serotonin.” (p. 340)

The science of biochemistry is not for the timid mind and it is a physician’s job to balance brain chemistry. But it appears that estrogen has a role in serotonin transmission, and it is known that lowered levels of serotonin are related to depression. One wonders

if it may be possible to counteract the effect of lowered levels of serotonin by increasing brain chemicals that have the opposite effect. In this regard, beta-endorphins have been studied in relationship to exercise and meditation (Harte, Eifer & Smith, 1995) and it has been shown that corticotropin-releasing hormone and beta-endorphins were elevated following meditation to levels that were similar to that experienced during exercise, often called the runner's high.

Since beta-endorphins levels are known to fluctuate during hot flashes, even though the data is inconsistent according to Freedman (Lobo, 1997), Sternfeld and colleagues suggested that decreases in the level of hypothalamic beta-endorphin during perimenopause may be implicated in the pathogenesis of hot flashes (Sternfeld, Quesenberry, & Husson, 1999). A correlation between beta-endorphin levels and hot flashes is encouraging given that beta-endorphin levels can be increased.

From the literature reviewed, it is difficult to directly relate estrogen levels to depression, yet there has been some agreement that sleep deprivation from night sweats affects mood. Additional studies need to be conducted to see if yoga therapy would benefit vasomotor symptoms even if the benefits were only temporary. The differences between women vary so much that it is difficult to make any conclusions without a deeper understanding of the relationship between the thermoregulatory system and beta-endorphin levels.

**Perimenopausal anxiety.** Depression, anxiety and stress can become a self-perpetuating cycle. Wheatley (1997) describes the acute response to stress as a reaction that induces a state of anxiety, and when long continued may develop into depression. A cycle becomes established where depression limits the ability to cope with stress,

resulting in an aggravation of the anxiety produced by stress. Add to this sleep impairment, which is a factor of depression and anxiety, and an image of the perimenopausal woman begins to emerge.

The anxiety of the perimenopausal woman, if symptoms are stressful and long-term, may or may not result in generalized anxiety disorder (GAD). GAD is excessive anxiety and worry occurring more days than not for at least 6 months and includes restlessness, fatigue, difficulty concentrating, irritability, muscle tension, disturbed sleep, or a combination of the above. Howell and colleagues suggest that this anxiety disorder is connected to gender-specific social roles or experiences, environmental factors, and childhood adversity, and that it worsens with premenstrual syndrome (PMS) (Howell, Brawman-Mintzer, Monnier, & Yonkers, 2001). Since GAD can be associated with PMS, it suggests that a similar association of GAD with perimenopause may exist.

A woman may experience anxiety during perimenopause depending on perceived internal versus external locus of control. Kennedy, Lynch and Schwab (1998) found that patients clinically diagnosed with various common anxiety and depressive disorders have a high external locus-of-control, in other words they tend to attribute control to other people they perceive as more powerful, or to chance (fate or luck). Their study was not case-controlled and they could not infer causality, but felt locus-of-control was important to the understanding of anxiety. The understanding of this relationship could lead to studies to determine what therapeutic techniques that alter the locus of control would be effective in decreasing anxiety and depression (Kennedy, Lynch & Schwab, 1998). This understanding is important to this project's intervention because yoga places locus-of-control internally. Reynolds (1999) showed a strong tendency for women high in

perceived control to practice psychological stress management during hot flushes (for example, relaxation, visualization, self-acceptance, etc.) thereby relieving some anxiety.

In addition, negative appraisals of hot flushes are associated with anxiety and lowered perceived control (Reynolds, 2000). Since attitude affects the experience of hot flushes, a woman may benefit from practicing techniques to regain a perceived sense of control to reduce anxiety. In yoga, control may be gained through a cooling pranayama while using concentrated awareness to visualize images of water, such as rainfall, to cool the affected areas of the chest, neck and face. Visualization may enable a woman to begin counteracting negative thoughts associated with low perceived control and thereby reduce anxiety.

Historically, the feeling of anxiety is “an intrinsic part of the condition of being human. It is a natural response, built into the human design, to certain environmental and psychological factors” (MacReynolds, 1975, p. 3). The feeling has always been with us, but the concept wasn’t developed until the Greek period when Democritus of Abdera in the fifth century discussed the need for tranquility in which the soul is undisturbed by fear, having an attitude of moderation and cheerfulness (MacReynolds, 1975). The practice of tranquility was emphasized because of the inner anguish associated with self-awareness accompanying the sense of individuality and personal responsibility. As cultures evolved, anxiety as a psychological condition became more apparent in less collective societies, along with the idea that man is a separate being. To address this anxiety, yoga therapy sees the separate self as an illusion and emphasizes unity as the foundation of our individuality.

Likewise, Ayurveda emphasizes unity as “based on the understanding of the connection of our individual bodymind to an underlying field of intelligence” (Lonsdorf, Butler, & Brown, 1995, p.220). Ayurveda is the science of physical and mental self-healing where the entire universe is one self, and yoga is the practice of self-realization (Frawley, 1999). Self-realization produces a spiritual consciousness of unity, and yoga therapy’s purpose is to create that awareness of unity on physical and emotional levels.

The Integrative Yoga Therapy Manual (LaPage, 1994) describes the evolution of unity consciousness in the following manner: tension, pain and suffering are doorways that lead us to the experience of happiness and inner satisfaction as we learn to work with the energy of our fear, anger, and grief. An inner awareness develops along with a sense of unity as the vascular and muscular systems relax, nourishment is brought to all parts of the body with the flow of fluids and energy, the heart rate balances itself, the emotional body is opened up, and breathing becomes relaxed and efficient. The effect of the relaxation response is integration of body, mind, and spirit and a balance between strength and flexibility. The energy it creates leads to consciousness of wholeness, and can demonstrate to practitioners that symptoms are simply the doorway to that consciousness (LaPage, 1994).

**Perimenopause and physical activity.** Yoga as a physical activity to alleviate menopausal symptoms can be viewed in light of Northrup’s (2001) study of the relationship between exercise and the menopausal transition. Northrup (2001) hypothesized that women taking estrogen and women who engaged in regular exercise would report fewer symptoms. The results showed that women who reported low amounts of exercise also reported significantly more vasomotor symptoms than women



engaging in moderate to high amounts of exercise. Women did not report fewer symptoms when taking estrogen, instead they reported significantly more vaginal dryness, headaches, trouble sleeping, and difficulty concentrating than women who did not take estrogen. Moderate to high amounts of exercise made the difference in symptoms reported, not estrogen therapy.

Regular physical activity in general improves various dimensions of mental health, increasing a sense of general wellbeing, positive mood and self-esteem, and decreasing anxiety and depression. Physical activity is inversely related to negative mood and anxiety, and directly related to positive mood, vigor, and overall well-being (Sternfeld, Quesenberry, & Husson, 1999). Once again, Sternfeld and Marcus (Lobo, 2000) speculated that the positive effect of physical activity on mental health during the climacteric can be attributed to increased release of beta-endorphins. Active and relatively active women have demonstrated significantly fewer and less distressful psychological symptoms during perimenopause (Suling, Holm, Gulanick, Lanuza, & Penckofer, 1999) even in the presence of hot flushes.

In another study Schell, Allolio, and Schonecke (1994) showed physiological and psychological benefits from the practice of yoga. Schell and colleagues measured cortisol and prolactin hormones, growth hormone, heart rate, blood pressure, and aggressiveness, excitability, openness, emotionality and somatic complaints in females practicing yoga. The control group relaxed by reading comfortably. Blood pressure and endocrine hormones were not significantly different between the groups, but heart rate was lowered in the yoga group. More significant differences were noticed psychologically with the yoga group showing higher life satisfaction and less aggression,