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last example of abnormal menstrual cyclicality—that of women without a uterus. *In vitro* fertilization techniques can, through a Host-Uterus Program, allow these women with irremediable sterility to have their own biologic child (7). It is the clinical applicability of advances such as those described in this paper that make basic and clinical research an important cornerstone of our health care system.

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## Women's Health: The Menstrual Cycle

### Climacteric Medicine: Cornerstone for Midlife Health and Wellness

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#### Synopsis .....

*Midlife care should consider the whole woman, with preventive attention to osteoporosis and cardiovascular disease. A new delivery system, using a skin patch, is available for replacement or additive hormonal therapy. Useful hormonal therapy may include both estrogen and progesterone.*

**I**N 1983, THE LIFE EXPECTANCY for females at birth was 78.3 years, and it exceeded that for men by 7.3 years; for women who reach the age of 65, a further 18.8 years of longevity can be anticipated (1). These encouraging data are marred by the reality of a significant impairment in the quality of later life, with many women confined to institutions. For example, about 5-15 percent of elderly women are transiently incontinent (2), the prevalence increasing to 40 percent in hospital patients (3) and more than 50 percent in institutionalized persons (4). More than \$8 billion per year is spent on care for the incontinent, institutionalized elderly. Osteoporosis is another condition that impacts negatively on the health status of elderly women. More than 300,000

women fracture their hips due to osteoporosis each year and, of this number, about 12-20 percent die due to factors directly attributable to the fracture (5). Only one-third of the survivors will regain normal activity (6). The total cost of osteoporosis (including fractures of the vertebrae) was estimated to be \$6.1 billion in 1983 (7). Cardiovascular disease is another cause of significant morbidity; it accounted for 51 percent of all deaths in 1981 at an estimated cost in 1984 of \$64.4 billion (8). Death from heart disease affects women, too, resulting in 10 times more deaths than breast cancer.

This list of seemingly unrelated conditions are in fact linked by at least two life events: chronological aging and the senescence of ovarian function. The

development of these diseases during the postmenopausal period signals the true pathophysiologic significance of the menopause, a condition that until recently was perceived by many as a nuisance experienced by women, and one which comprised a singular problem, hot flashes, and one main treatment, estrogen therapy. When examined in the broader perspective of the climacteric, however, the menopause will be seen to have a profound effect on a woman's well-being, often affecting issues far removed from the reproductive system.

### **The Climacteric and Menopause in Perspective**

The menopause is a natural phenomenon that usually lasts about 1 week—the duration of the last menstrual period. It is the biological marker of the gradual but persistent decrease in ovarian steroidogenesis that precedes the cessation of menstruation by about 15 years, and which postdates that event by a similar duration. This period of reproductive senescence is known as the climacteric. The differentiation between the menopause and the climacteric involves more than semantics, since it serves to illustrate that the midlife physical and psychologic needs of women extend over a 30-year continuum.

The date of the menopause can be accurately pinpointed: it is a retrospective diagnosis, a year of amenorrhea having to pass before the clinical diagnosis can be confirmed. The mean age of onset of the menopause in Western societies is 51 years (9). The climacteric may be empirically, but pragmatically, categorized into three decades of clinical presentation and need: the early climacteric (age 35–45), the pre- and postmenopause (age 45–55), and the late climacteric (age 55–65) (10). Each decade is characterized by specific changes that affect the immediate and later health of women.

### **The Early Climacteric**

The first clinical sign of a change in ovarian function is a shortening of the menstrual cycle. This change is associated with a decrease in estradiol secretion, and it usually involves the first phase of follicular development. The menstrual cycles later begin to lengthen, and anovulatory cycles are interspersed with ovulatory cycles. The former result in various estrogen withdrawal bleeding patterns—irregular periods with intermittent and prolonged spotting (low estrogen profile) or prolonged periods of amenorrhea with sudden and profuse bleeding (high estrogen profile). This potential

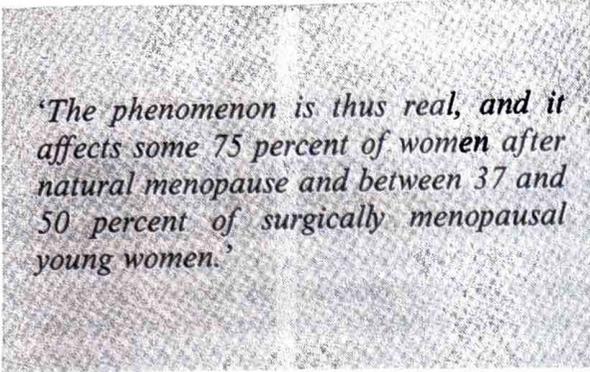
climacteric problem necessitates skilled medical intervention.

Despite the progressive down-regulation of ovarian function, women in the early climacteric are at significant risk of becoming pregnant. Approximately 75 percent of women between 40 and 45 ovulate regularly; the number decreases to about 60 percent in women 45–50. Ovulation is infrequent in women beyond 52 years (11). Morbidity and mortality for both the fetus and the mother are extremely high, should pregnancy occur. Yet very little research is being conducted in this area, and only rarely are the contraceptive needs of climacteric women addressed. However, all women are familiar with the injunction: women over the age of 35 should not use oral contraceptives! The issue has become even more urgent with the virtual elimination of the intrauterine device from clinical practice. Given the 15 years of contraception needed by women who elect not to be sterilized (or their husbands to have a vasectomy), very few alternatives are left other than some form of barrier contraception. Despite the reservations regarding oral contraceptive usage in premenopausal women, a recent study has shown that low-dose oral contraceptives can be safely taken, provided the women are physically active and do not smoke (12).

Approximately 30–50 percent of menstruating women experience significant premenstrual symptoms (13); with 60 percent of women in the work force today, the cost to our economy due to absenteeism exceeds the \$5 billion estimated in 1969 (14). What is not generally recognized is that the maximum incidence of premenstrual syndrome (PMS) occurs in women over the age of 30, that is, in the early climacteric (15). The typical symptoms of irritability, depression, insomnia, alterations in libido, and fatigue are frequently indistinguishable from early menopausal symptoms. Fortunately, the latter etiology has two distinguishing clinical features—noncyclicality of symptoms and elevated plasma follicle-stimulating hormone—that enables the clinician to prescribe the appropriate therapy. Typical menopausal symptoms in women who are still menstruating are not uncommon; like their amenorrheic peers, treatment is primarily with hormonal therapy.

### **The Perimenopause: Pre- and Postmenopause**

As the climacteric progresses, ovarian function continues to diminish to the point where the last natural menstrual period (the menopause) occurs, and is accompanied by a number of so-called estrogen-dependent symptoms: hot flashes, per-



*'The phenomenon is thus real, and it affects some 75 percent of women after natural menopause and between 37 and 50 percent of surgically menopausal young women.'*

spiration, palpitations, and target tissue changes such as vaginal dryness. The hot flash refers to the subjective feeling women experience prior to a physiological measurable change, the flush. Flushing is caused by a transient dilation and is associated with a sudden increase in blood flow. Since the number of cutaneous blood vessels, and hence blood flow, is greater in the face, flushing is characteristically experienced in the face and upper thoracic area. The mean temperature increase during a hot flash is 2.7°C and lasts an average of 31 minutes (16). The phenomenon is thus real, and it affects some 75 percent of women after the natural menopause, and between 37 and 50 percent of surgically menopausal young women. Vasomotor complaints tend to decrease as the postmenopause interval lengthens, but symptoms persist in many women. Sixty-five percent of women between 54 and 65 years of age remain symptomatic, and 30 percent of those over age 65 (17).

Many postmenopausal women on estrogen therapy report an improvement in general well-being, cognitive functioning, and sleep patterns. Much of the psychologic dysfunction noted by these women—depression, impaired memory, insomnia, irritability, and listlessness—is indeed hormone-dependent and responds dramatically to estrogen therapy. The relationship between ovarian steroids and central neurotransmitter function has been well established, and it explains the response of some menopausal women to sex steroid therapy. It must always be borne in mind that there are many other medical and environmental reasons for these psychologic symptoms, and appropriate measures need to be taken to exclude them.

As estrogen deprivation continues, the vagina loses its elasticity and develops a thin, pale epithelium that is prone to ulceration and infection. These changes cause symptoms of dyspareunia and vaginitis—usually referred to as atrophic vaginitis. Treatment is specific and invariably successful; the

topical application of low doses of estrogen vaginal cream thrice weekly soon restores the epithelium and underlying tissues to normal.

New methods and approaches to hormonal therapy are being introduced into clinical practice. A brief review of the hormonal changes during the peri- and postmenopausal period illustrates the need to differentiate between hormone replacement and hormone additive therapy. Basically, there are three hormones that are clinically relevant: estradiol (the predominant estrogen in the premenopausal period); estrone (the estrogen primarily secreted postmenopausally); and progesterone, the "second female hormone", secreted during the second half of the premenstrual cycle, and absent in postmenopausal women. The postmenopausal hormonal milieu is characterized by a reversal in the ratio of estrogen predominance from estradiol/estrone (in reproductive cycling women) to estrone/estradiol. Postmenopausally, there is a reduction in total estrogen production and hence plasma concentrations. It is thus normal for postmenopausal women to be "estrogen deficient." Postmenopausal women also do not secrete progesterone.

All of the estrogens available for oral use are either synthetic (usually ethinyl estradiol), or if from a natural source, they are converted in the enterohepatic circulation to estrone. Thus, the only way estrogen can be administered as estradiol is by injection, estrogen pellet implants, creams, or skin patches (18). The term estrogen replacement therapy is appropriate when referring to the use of one of the latter methods to replace estradiol in surgically menopausal women; hormone additive therapy is more correctly applied to the use of estrogen (either oral or parenteral) in postmenopausal women (who are normally estrogen deficient). Estrogen replacement therapy is an attempt at physiologic replacement (similar to the use of insulin by diabetic patients), whereas estrogen additive therapy is a pharmacologic approach, and as such is liable to the side effects associated with any other form of pharmacologic therapy.

Several retrospective studies in the mid-1970s implicated estrogens in an increased risk for endometrial cancer (19). Subsequent experience has shown that 10–13 days of added progestine reduces the risk of endometrial cancer to less than that of untreated postmenopausal women (20). It has now become routine practice to prescribe progestins (synthetic progesterone) with estrogens in all women with an intact uterus. In addition, at least two endometrial biopsies are recommended: 3 months after therapy has started and 1 year later. Bleeding

at unscheduled times is an indication for further evaluation, often by dilation and curettage.

### The Late Climacteric

Osteoporosis and atherogenic disease are two conditions that occur in the late climacteric, and by the nature of their pathogenesis are potentially preventable (if appropriate lifestyle habits are adopted in the earlier adult and climacteric years) or reversible by the recognition of preconditions such as osteopenia.

**Osteoporosis prevention by osteopenia recognition.** The subject of osteoporosis is discussed elsewhere, and will not be elaborated on other than to comment on the important role of the primary care physician in the recognition of osteopenia.

Bone is a living and vital tissue and, just as in other organ systems, is constantly being lost and replaced with new, healthier tissue. Usually the bone that is lost is replaced with an equivalent amount of bone. Under certain circumstances, more bone is lost than is replaced, and a condition known as osteopenia results. This is a precondition to osteoporosis, and although both are characterized by diminished bone mineral, the structural integrity in osteopenic subjects is still intact, whereas osteoporotics have fractures that characterize their disease. Osteopenia is potentially reversible, while osteoporosis is irreversible.

It is possible to develop a profile of women who are at higher risk of developing osteoporosis: women who are white or Asian, those with a positive family history of osteoporosis, a small frame; and especially those who have had a premature (before age 45) or surgical menopause. These factors may be referred to as initiators of osteoporosis over which the individual has no control. Added to this are factors which may accelerate bone loss, and over which everyone does have some control, such as dietary factors (deficient intake of calcium and high intake of calcium-losing foodstuffs, for example, protein), inactivity, and excess alcohol, smoking, and caffeine intake. These physical and social characteristics can be readily identified, but there are two even more important predictors which are much more difficult to establish, namely: bone strength (at a given point in time) and the rate of bone loss. According to Heaney (21), low bone mass is clearly related to fracture, since 80 percent of the compressive strength of cortical bone and 70 percent of the compressive strength of trabecular bone is related to bone mass. Some investigators believe that bone mass at meno-

pause is the best predictor of bone mass 20-30 years later (22).

Total body bone mineral can be accurately measured by dual photon absorptiometry as tested in excised vertebrae, *in vivo* in normal subjects, and in those with metabolic disease (23, 24). The results correlate very highly with total body calcium measured by neutron activation analysis. Both techniques are impractical for everyday clinical practice as a means of differentiating normal from osteopenic subjects. There is much controversy regarding the relevance of peripheral bone measurements to the axial skeletal bone mass. Nevertheless, a number of studies show a clear and statistically relevant relationship between bone mineral values at a peripheral site and total bone mineral content (25, 26). A pilot study performed at the Center for Climacteric Studies on 309 women attending a clinical service (some of whom were known osteoporotics) showed an excellent correlation ( $r = 0.80$  and  $0.75$ ) between the distal radial bone mineral content (measured by single photon absorptiometry) and the total body bone density and total body bone mineral content, respectively, as measured by total body dual photon absorptiometry ( $P < .0001$ ). This result is similar to that reported by others. In the author's opinion, it is as important to know that the person is osteopenic as it is to define accurately the involved site. This is the difference between screening for a disease versus the making of a precise diagnosis.

Using a single photon densitometer, a screening program was conducted recently among asymptomatic white and black women from a low socioeconomic group, all of whom were above age 60 and therefore were prime candidates for osteoporosis. Two main conclusions relevant to screening for osteopenia emerged: it is possible to clearly differentiate between a high and a low bone mass population (blacks versus whites) using this technique and, the prevalence of osteopenia (as opposed to osteoporosis) in an at-risk population is high and justifies the introduction of screening procedures. Using an empirically defined threshold (0.65 g per cm), 15 percent of the black and 45 percent of the white women screened were found to be at risk. The mean bone mineral content (BMC) of the black women was significantly greater than that of the white women at each age. This experience is summed up in a recent paper (27), which concluded: "It is possible that radius BMC/W could be used in osteoporosis for screening purposes, even without providing a clear diagnosis."

In this context, it must be recognized that osteopenia does not of itself predict that an individual

*'Exercise to stimulate new bone formation, good nutrition to aid in the mineralization of the newly formed bone, and the selective use of hormone therapy to regulate bone loss form the basis of an effective osteogenic therapeutic triangle.'*

will suffer a fracture. Other factors, such as bone collagen, elasticity, and a tendency to fall, for example, are other important issues that need to be considered. Nevertheless, an objective measurement of osteopenia can be very helpful in selecting those postmenopausal women with no apparent bone disease who might benefit from prophylactic estrogen replacement therapy, since it is known to conserve bone mass. To aid in the selection of these women, consideration should be given to testing the calcium to creatinine ratio in the second voided urine sample after an overnight fast, and the urinary hydroxyproline to creatinine ratio. Values in excess of 0.16 and 0.015, respectively, are indicative of accelerated bone loss.

Single photon absorptiometers are currently not available to most private health care providers, and some question whether they should be made available. More time and experience is needed before the eventual role for this technology will be defined. Realization that the test assesses only one factor (bone mineral); that it requires appropriate training; that the result must be correlated with the patient's history and clinical findings; and that a means of instituting some measure of quality control are some prerequisites to ensure against the abuse and misuse of this osteopenia screening test. Difficulties involved in achieving these should not cloud the possibility that single photon absorptiometry is a cost-effective (less than \$50), safe, and practical way that could potentially identify between 75 and 80 percent of normal women with otherwise unidentifiable osteopenia. This figure compares to the accuracy of both mammography and the Pap smear when these modalities are used to screen for breast and cervical cancer, respectively.

Although the physiology of bone and the etiology of osteoporosis are both complex and multifactorial, clinicians are actually faced with only two practical issues other than osteopenia identification: They need

to help women accrue as much bone as possible before menopause; and they need to prescribe and supervise lifestyle changes and specific therapies to regulate the rate at which bone is lost postmenopausally. Exercise to stimulate new bone formation, good nutrition to aid in the mineralization of the newly formed bone, and the selective use of hormone therapy to regulate bone loss form the basis of an effective osteogenic therapeutic triangle.

**Cardiorespiratory wellness.** Coronary heart disease is not only a disease of men: the incidence in postmenopausal women is three times greater than in premenopausal women (28). Although we are again dealing with a multifactorial disease, physically active persons have fewer clinical manifestations of coronary heart disease than their sedentary counterparts. Further, if coronary events do occur, they are usually less severe and happen at an older age.

**Biochemical benefits.** Regular exercise modifies risk factors related to atherogenic heart disease such as hypertension and the blood lipids and lipoproteins. In order for physical activity to have a meaningful impact, exercise must be done regularly and be of sufficient intensity and duration. For example, the blood lipid profile—mainly an increase in the cardioprotective high-density lipoprotein (HDL)—improves only after 4 months of running 10–15 miles a week (29). With moderate activity such as walking, about 30 miles per week for 3 months is necessary before a significant increase in HDL cholesterol will occur (30). Although aerobic endurance activities—such as swimming, bicycling, and long-distance running—have usually been associated with improved lipids and lipoproteins, muscle-strengthening resistance exercises like weightlifting also have a favorable effect on blood lipids and lipoprotein concentrations (31).

**Fitness evaluation.** The maximal oxygen uptake ( $VO_{2max}$ ) is the amount of oxygen taken up by the entire body during maximal effort. Physical exercise performed at activity levels less than 50 percent of  $VO_{2max}$  can be maintained for hours; to achieve physical fitness and its associated benefits, training needs to be performed at 70–85 percent of  $VO_{2max}$  for at least 20–40 minutes three times a week (32). Training levels sustained in excess of this range could be harmful to individuals with asymptomatic cardiovascular disease. For sedentary (and middle-age) women who wish to participate in meaningful

Table 1. Guidelines for fitness assessment by maximal oxygen uptake of healthy women age 30 to 70 years

Age group	VO <sub>2max</sub> (ml per kg per min)				
	Poor	Fair	Average	Good	Excellent
30-39 years.....	< 20	20-27	28-33	33-44	45 +
40-49 years.....	< 17	17-23	24-30	31-44	42 +
50-59 years.....	< 15	15-20	21-27	28-37	38 +
60-69 years.....	< 13	13-17	18-23	24-34	35 +

SOURCE: Adapted from "Exercise testing and training of apparently healthy individuals: A handbook for physicians, American Heart Association, 1972, p. 15.

exercise, the graded exercise test—the treadmill test—is as integral a part of screening a patient as is the medical history. It is also an important key to determining a proper exercise program and can serve as a measure of the conditioning effect of training.

There are many protocols for graded exercise testing, all of which accomplish essentially the same thing (12). Graded exercise testing is classified as either maximal or submaximal. A maximal test imposes progressively increasing workloads on the exercising subject until exhaustion. This test requires the collection and analysis of expired air samples, and it is performed in a laboratory not available in most clinical settings. Submaximal testing, on the other hand, is better suited to the practicing physician; a stationary bicycle is used and the patient rides against a progressively increasing workload until a given heart rate or workload is achieved. This point is used to estimate the VO<sub>2max</sub> (33).

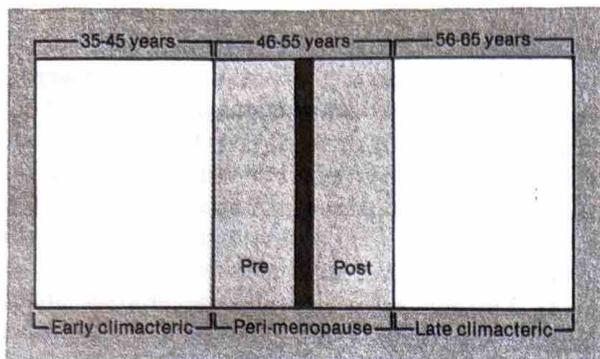
Several studies have shown that submaximal testing correlates well with actual maximal testing when corrected for age, but none of these studies have examined climacteric women. One hundred sixty-three healthy sedentary females between the ages of 35 and 75 years had a maximal VO<sub>2max</sub> test performed at the Center for Climacteric Studies using a modified Balke procedure, and the results were compared with a matched group of 121 women tested on an ergometer. The actual and estimated VO<sub>2max</sub> data and the range of values for subjects in both groups were similar. A subgroup of 29 climacteric women were tested by both tests, and again a close correlation was obtained ( $r = 0.789$ ). Finally, since the onset of the menopause has been linked with an abrupt change in the cardiorespiratory fitness of females, a group of women age 45 to 55 years were divided according to whether or not they were still menstruating. Their menopausal status was defined by hormonal analysis and a history of 1 year's amenorrhea. No significant differences in the estimated VO<sub>2max</sub> were noted, indicating that the men-

opause per se does not influence cardiorespiratory fitness. Based on the documented decline in both maximal and submaximal testing in our laboratory, we have developed guidelines for evaluating the fitness status of climacteric women, using either method. (34). Guidelines such as these are useful before prescribing exercise (see table 1).

The functional loss in cardiorespiratory function associated with perimenopause coincides with age-related changes and can be reversed by a program of regular physical activity. In a recent study, premenopausal women (mean age of 41 years) trained for 9 weeks and improved their VO<sub>2max</sub> by 12.1 percent, while a similarly trained postmenopausal group (mean age 57 years) improved their VO<sub>2max</sub> by 19 percent (35). We evaluated 63 postmenopausal women (mean age 56 years) before and at 6-month intervals for 1 year during a structured program that involved three weekly 20-minute treadmill, ergometer, or Nautilus (muscle strengthening) sessions. Two nonexercising groups were included: an age-matched group receiving hormones and a control group. Subjects exercised until their heart rates were between 70 and 85 percent of the maximal heart rate. Significant improvements in both VO<sub>2max</sub> and time on the treadmill were recorded and maintained by bicyclist and treadmill groups.

In summary, we have determined that submaximal testing can be used as a screen to determine cardiorespiratory fitness in climacteric women. Patients at higher risk for cardiovascular disease and those classified as having fair or poor health as measured by ergometry require more detailed evaluation before embarking on a prescribed exercise program. We have also established that previously sedentary climacteric women can train and maintain a state of physical fitness for at least 1 year. Exercise is probably cardioprotective. Although this effect may not translate into longevity for all who exercise, there is compelling evidence that exercise does en-

## The climacteric—three decades of health needs



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hance the feeling of well being and hence the quality of life.

### Chronologic-Related Midlife Changes

The climacteric occurs chronologically at a time when age-related conditions occur that are not causally related to failing ovarian steroidogenesis. These conditions merit the interest and expertise of the midlife healthcare practitioner.

Urinary incontinence is experienced by about 40 percent of postmenopausal women. With the current knowledge of the anatomy and physiology of micturition, much can be done to identify the cause and secure a cure or symptomatic control of this debilitating disorder. Urodynamic evaluation allows for the identification of the etiology and can differentiate, for example, between bladder dyssnergia, which is treated medically, and the anatomical defect of stress incontinence, which requires surgical correction. More recently, success has been achieved by the use of behavioral techniques, including bladder sphincter biofeedback and toilet skills training (36). Patients with stress incontinence reduced their episodes of incontinence by 82 percent; the respective figures for women with detrusor motor instability

and urge incontinence were 85 percent and 94 percent, respectively.

Cancer is an unfortunate concomitant of aging. Breast cancer will occur in 1 of 11 women in the United States; according to the American Cancer Society, 119,000 new breast cancers were diagnosed in 1985, and 38,400 women will have died from this malignancy in 1986 (19). The respective figure for death from lung cancer in women is 38,600 (19). Cancer of the colon and rectum is the third most common cause of cancer death in American women. Colorectal cancer is expected to become the second leading cause of cancer death in women. A third of the 58,000 persons who died from this disease in 1986 were women (37).

For all of these cancers, preventive measures (for example, to stop smoking, and to adjust dietary and bowel habits from an early age) and early and regular diagnostic techniques need to be included in the advice and management protocols of the midlife woman's health assessment. Diagnostic techniques include breast self-examination, mammography, rectal examination with testing for occult blood, and flexible sigmoidoscopy. The guidelines set by the American Cancer Society should be followed.

### The Total Woman

All too often women are viewed by physicians in an anatomical or segmented fashion, according to the physician's specialty: the cardiologist concentrates on the heart, the gynecologist the pelvis, and so forth. A fundamental principle of climacteric medicine is to consider the woman as a total person and to include in this assessment the role of her environment.

Mental well-being is as important as physical health. This desired state can be largely achieved by educating the consumer and her spouse about the physiologic changes that surround menopause and how these changes could impact on their interpersonal and family relationships. Much can be done to help women achieve an appropriate mental balance: counseling, stress management, and biofeedback are appropriate avenues to which women should have access. Having an informed health care practitioner available to listen to a client's fears and doubts serves an excellent psychologic catharsis and allows for the correction of myths and inappropriate attitudes about the climacteric. Where appropriate, exercise and hormonal and psychotherapy can be prescribed to help individuals cope with some of the emotional concomitants of the climacteric (38).

Sex and sexuality are issues that are frequently of concern to climacteric women, but these topics are infrequently raised by patients when visiting their physician or are inadequately managed by the physician. Sexual problems may be related to a decrease in libido, secondary to the irritability, tiredness, and insomnia associated with the menopause; or there may be a definite problem such as vaginal dryness causing painful intercourse. Clinical expertise is needed to determine the cause and prescribe appropriate therapy. Inquiry into the patient's home situation will often reveal the cause of a given sexual dysfunction. For many women, cessation of sexual activity is not a choice, but a result of lack of partner availability. As with mental stress, counseling by experienced personnel will allow women to get a better perspective on some of the acknowledged alternatives in sex physiology which do occur with aging. Armed with this information—and the fact that pregnancy is no longer a potential problem—most climacteric couples can maintain a gratifying sexual relationship (39).

As noted previously, women can expect to live at least one-third of their lives after their menopause. If the individual is physically and mentally well, these can be the most productive and satisfying years for women. Relieved in large measure of the demands and responsibilities of child rearing, women should be encouraged to view postmenopause as a period for self-investment. Advantage should be taken of the "empty nest" to use the extra time and finances that may now be available to branch into new careers, develop hobbies, and in general, consolidate their professional and domestic goals. Many women will need guidance and help. Counselors experienced in helping women to evaluate their talents, abilities, and life goals will contribute immeasurably to the women actually achieving her total (and her family's) well-being.

The educational and sociologic support of women during their pre- and postmenopause years is akin to the known benefits derived from prenatal classes. Knowing what to expect and how to cope with the physiologic changes discussed previously can prepare and consolidate the expectations of women as they experience the climacteric. This educational experience can be summed up by referring to the process as "The Lamaze of the Middle Years".

### Conclusions

The public must be made fully aware of the need for preventive medicine. The earlier that its practice is initiated, the greater the reward. As noted recently

*'... women can expect to live at least one-third of their lives after their menopause. If the individual is physically and mentally well, these can be the most productive and satisfying years for women.'*

(40): "Women are not frail; by widespread consumer education, early lifestyle behavior modification and the productive use of modern technology, the image of the shrunken little old lady should be condemned to history and replaced by women imbued with vitality and a zest for an active and productive old age."

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