

EXERCISE PRESCRIPTION FOR THE MENOPAUSAL YEARS

Promoting and Enhancing Well-Being

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LEARNING OBJECTIVE

- To provide the fitness professional with the current evidence, considerations, and guidelines for providing exercise counseling to women throughout the menopausal transition.

Key words:

Women, Abdominal Fat, Bone Mass, Quality of Life, Weight Loss, Cardiovascular Disease, Physical activity

INTRODUCTION

The menopausal transition (MT) is associated with several adverse symptoms and health effects, making it a difficult stage of life for many women (6,41,42). Although most women will gradually experience a decrease in these symptoms for a time after menopause, during this stage there is a higher incidence of diseases, such as osteoporosis and coronary heart disease, associated with menopause (27,30,42). Given that the average age of menopause is 51 years for U.S. women, and the average life expectancy for a woman is the early to mid-80s, it is notable that a third of a woman's life is postmenopause. Furthermore, because women comprise an increasingly larger portion of the aging population, it is important for health fitness professionals to understand the health concerns associated with menopause.

This article will address some of the common health concerns of the woman in menopause and how an exercise program can affect her. The evidence for beneficial effects of exercise during and after menopause has increased over the last decade, in part because of the Women's Health Initiative (31), inclusion of women in exercise

and clinical research, and the search for alternative therapies to hormone replacement therapy (HT). Much of the research on physical activity and exercise during menopause is longitudinal, but there also are some randomized controlled trials supporting exercise's positive effects during the MT. What is clear is this: women in this life stage benefit from and respond to exercise similarly as younger women (2).

WHAT IS MENOPAUSE?

Menopause literally means the cessation of menses. Every woman will experience menopause at some time in her life, with most experiencing menopause sometime after 40 years of age (42). With aging, ovarian function begins to diminish, and as a result, there is a gradual



TABLE 1: The Stages of Reproductive Aging (STRAW)

Perimenopause	The time around the menopause. Begins with the menopausal transition through menopause.
Menopausal transition	The time before menopause when the menstrual cycle varies in length along with accompanying endocrine changes. Ends with the final menstrual period.
Menopause	12 months after the final menstrual period.
Postmenopause	The time after menopause. Early postmenopause is the first 5 years after menopause, during which ovarian hormone functions.

(Adapted from reference [39]).

decrease in estrogen secretion which affects the menstrual cycle (8). Women go through several stages during reproductive aging that often are identified using the Stages of Reproductive Aging Workshop (STRAW) classification system, shown in Table 1 (38).

According to STRAW, the MT begins when there are variations in menstrual cycle occurrence, period length, and an accompanying increase in follicle-stimulating hormone. Next, the perimenopausal stage begins simultaneously with the MT, but it is more specifically defined as the year before the final menstruation. Finally, a woman has undergone menopause when there has been no menstrual cycle for 12 consecutive months; the date of her last period is her menopause. The postmenopause stage is the years that follow menopause (38).

SYMPTOMS ASSOCIATED WITH MENOPAUSE

Some signs and symptoms associated with the MT can be found in Table 2. Any of these symptoms can lead to feelings of irritability, depression, and anxiety that also are associated with the MT. The exact mechanisms for many of these symptoms have not been established, but it is evident that they are linked to the decline of endogenous estrogen because they usually disappear with the use of HT (11). For example, hot flashes are thought to be a vasomotor symptom or the result of fluctuating hormone levels disrupting temperature regulation in the brain's hypothalamus. Hot flashes can occur at any time during the day or even in the middle of the night (night sweats), contributing to insomnia, fatigue, and moodiness (39). The MT varies in severity from woman to woman. A woman's experience during menopause largely can be affected by her expectations, emotional state, social support, and the lifestyle interventions that she chooses to incorporate during this transition.

HEALTH EFFECTS

Weight Gain

Menopausal women often express that they experience difficulty in maintaining their usual weight or in losing weight. In

the United States, obesity is more prevalent in women ages 40 to 59 years (41%), compared with 30% of women 20 to 39 years of age (34). Although the blame for higher rates of overweight and obesity often is placed entirely on menopause, excess weight also can be attributed to a common factor in this age group: a decreased level of physical activity (26).

Several studies suggest that women who are physically active after menopause can maintain lower body weight and sufficient lean muscle mass (24). Although most women gain weight during postmenopause, body weight changes are attenuated in women who achieve sufficient levels of physical activity.

Fat Distribution

Many menopausal women experience not only weight gain but also an increase in abdominal fat (android or belly fat) deposition and a shift from the gluteofemoral fat pattern (gynoid or hip fat) that women typically exhibit premenopause. Data from 2003 to 2006 National Health and Nutrition Examination Survey show that women experience a linear increase in waist circumference, an index of abdominal adiposity, with age (29). Cross-sectional data show that abdominal fat increases as women enter postmenopause, even without a change in body weight. This increase in abdominal fat deposition is linked to the decrease in estrogen, which signals fat to be stored in the hips and thighs. Abdominal fat can be subcutaneous (under the skin) or visceral (between the visceral organs). Accumulation of visceral abdominal fat independently raises the risk for cardiovascular disease (CVD), in part because it also is associated with dyslipidemia, insulin resistance, and hypertension (30).

It is important that the issue of spot reduction is addressed with the menopausal client, particularly with respect to abdominal fat. Mounting evidence shows that regular aerobic physical activity cannot only prevent fat gains but also promote visceral fat loss even in the absence of overall weight loss, thus reducing the risk of cardiometabolic disease (23). For example, the Dose Response to Exercise in Women (DREW) trial (10)

TABLE 2: Common Signs and Symptoms Associated with the MT

Symptoms

Skipped periods

Hot flashes

Sleep disturbances

Headaches

Mood swings

Urinary incontinence

Weight gain

(Adapted from reference [6]).

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found that postmenopausal women engaging in one of three volumes of exercise (4, 8, or 12 Kcal/kg per week; approximately equal to 50%, 75%, and 100% of the target recommendations of the *Physical Activity Guidelines for Americans* (40) experienced a reduction in waist circumference that was independent of the amount of weight lost. Furthermore, each level of exercise energy expenditure effectively reduced waist circumference by a similar amount. Comparable results have been reported in premenopausal women (20).

Cardiovascular Disease

Heart disease is the principal cause of death among women, and more women than men die of CVD each year (30). Premenopausal women have a very low incidence of heart disease compared with age-matched men; however, by age 70 years, the incidence rates are similar for women and men. Among the risk factors for CVD, very common independent risk factors occurring during perimenopause and postmenopause are physical inactivity, obesity (body mass index [BMI], ≥ 30), and an increased waist circumference (>35 inches for women). In addition, postmenopausal women more often experience high blood pressure, elevated triglycerides and low-density lipoproteins (LDLs), and decreases in high-density lipoproteins, compared with younger women of similar BMI (30). The combination of aging and estrogen deficiency in the postmenopausal woman, combined with the greater number of risk factors present, contribute multiplicatively to CVD risk in the postmenopausal woman (30).

Regular physical activity and weight loss can improve the risk factors that contribute to heart disease in women (30). Exercise of sufficient quality and quantity improves blood lipids, reduces insulin resistance, promotes weight loss or weight maintenance, and attenuates abdominal fat gains in perimenopausal and postmenopausal women (10,30).

Bone Mineral Loss

A reduction in bone mineral density (BMD) accompanied by an increased risk for bone fractures also is associated with the MT and aging. Epidemiological evidence demonstrates that a 50-year-old woman in the United States has a 40% chance of an osteoporotic fracture for the rest of her lifetime (27). Although BMD slowly declines beginning after the third decade, there is an exponential decrease in the bone remodeling process during perimenopause and postmenopause because estrogen plays an important role in calcium regulation and bone resorption. Like many diseases, the severity of BMD loss is dependent on several factors, such as family history, medications, smoking, alcohol, diet, and exercise (25,27).

Regular weight bearing and dynamic physical activity have positive effects on BMD in all populations by promoting an increased rate of bone remodeling and mineral deposition into the affected bone(s) (25,35). Furthermore, exercise can help prevent falling, a leading cause of fractures, because it enhances muscular



strength and balance (32). The American College of Sports Medicine (ACSM) (25) and the North American Menopause Society (NAMS) (27) recommend safe weight bearing and resistance exercise to attenuate bone loss or to improve BMD.

Quality of Life and Mental Health

According to the U.S. Centers for Disease Control and Prevention, quality of life (QOL) is a person's perception of their physical and/or mental health and how their health affects their daily life. In general, menopausal women who experience more symptoms or more severe symptoms, such as sleep deprivation, weight gain, or sexual dysfunction, report lower QOL compared with women with fewer occurrences of such symptoms or milder symptoms (4). Major depressive disorder is not directly linked to menopause, but postmenopausal women may experience depressive episodes, particularly given the many physiological and psychosocial changes occurring during this stage of life (41).

Both experimental and epidemiological data show that women and men with greater levels of physical activity also report higher QOL (28). A recent trial evaluating the dose response to exercise found that higher levels of physical activity were associated with improvements in QOL among previously sedentary postmenopausal women (13). Whether exercise can alleviate vasomotor symptoms, such as hot flashes, a major contributor to reduced QOL in menopausal women, is uncertain (12); nonetheless, the NAMS and other medical groups recommend exercise as a complementary therapy to relieve vasomotor symptoms (13). There also is evidence revealing the positive influences of exercise in preventing and treating mental health disorders, such as depression and anxiety, by directly affecting brain physiology and function (17).

In summary, there is evidence that exercise can be helpful in alleviating a number of physical and mental health effects associated with menopause. Table 3 summarizes these findings.

SOCIAL FACTORS

An important factor that often is overlooked when working with menopausal or postmenopausal women is their changing social

TABLE 3: Influence of Exercise on Menopausal Symptoms

Symptom	Effect of Exercise
Weight gain	Helps maintain weight or promote weight loss via increased caloric expenditure
Abdominal fat	Decreased visceral fat independent of weight loss
Cardiovascular disease	Improves risk factors including ↓hypertension, ↓triglycerides, ↓LDLs, ↓weight, ↓waist circumference, and ↓insulin resistance
Bone health	Reduces bone loss
Mental health	Increases quality of life, reduces depression and anxiety, and enhances cognitive function
Hot flashes (vasomotor symptoms)	May help control mild hot flashes
Urogenital atrophy or incontinence	Strengthen the pelvic floor muscles

situation, which can contribute to the challenges they experience. For example, during this stage, women may be facing major changes in their roles: their children may leave the home; they may be facing retirement; and they may be dealing with health issues or death of their aging parents or spouse. Any of these social situations can contribute to chronic stress, insomnia, and feelings of loneliness, anxiety, or depression (4).

In addition, some of the physical symptoms that may occur during this period can affect a woman's social life. For example, if a woman has experienced weight gain, she may be more reluctant to leave the house, or if she has recurring hot flashes or is incontinent, she may avoid certain social situations because of the potential for embarrassment. All of these psychosocial issues can affect a woman's interest in exercising and ability to exercise regularly.

EXERCISE PROGRAM DESIGN CONSIDERATIONS

Basic principles of exercise program design (specificity, overload, and progression) using the frequency, intensity, time, and type principle (FITT), consistent with the recommendations of ACSM (1,3,21,32) and the *Physical Activity Guidelines for Americans* (40), should be followed when developing an exercise program for the menopausal client, taking into account her goals, lifestyle, and health factors. However, we will focus on some specific considerations related to menopause that we have discussed in this article, of which, even the client herself may not be aware, and how we can address these concerns.

As part of the screening of the menopausal woman, the fitness professional must be aware of the client's current medical conditions and medications, including alternative treatments that she may be using to treat symptoms because these may affect exercise responses. Available data suggest that more than 40% of perimenopausal women seek medical advice for the treatment of their symptoms, and many self treat using over-the-counter treatments (39).

Cardiorespiratory Exercise

Consistent with the recommendations of ACSM (1,21,32) and the *Physical Activity Guidelines for Americans* (40), women seeking to improve their health and well-being should aim to achieve 5 days or more per week of 30 to 60 minutes of moderate-intensity physical activity or 3 days or more per week of 20 to 30 minutes of vigorous activities, or a combination of moderate and vigorous activity. Women going through the MT and postmenopausal women vary widely in age, lifestyles, and health status. Thus, when selecting a mode and intensity for aerobic exercise, consider current physical activity levels, health status, previous exercise history, physical capabilities, and feasibility (*i.e.*, access, cost, skill level, and goals).

The primary goal when choosing cardiorespiratory exercise is to engage large muscle groups. If a client's goals include weight loss, the exercise professional also should look for ways to maximize caloric expenditure by incorporating longer durations of physical activity or, alternatively, by incorporating intervals of varying intensities or including simultaneous upper and lower body movements. For weight loss, ACSM (15) recommends 150 and 250 minutes per week of exercise to prevent weight gain, and at least, this amount may be needed to promote long-term weight loss. To maximize effects on bone density, weight-bearing cardiorespiratory exercise (*e.g.*, walking) should be included in a program of exercise for the postmenopausal woman (25,27,35). As with all populations, less fit women should start with lower intensities of continuous or discontinuous physical activities and gradually progress to higher intensities and longer durations of exercise to attain target volumes of exercise as tolerated. Cardiorespiratory exercise also can be a great source of fun and camaraderie for



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some women, so encouraging the client to find a friend with whom to exercise or to join a class can be a major motivator to commit to regular aerobic activity and also address some social needs that may occur during this life stage.

Resistance Exercise

Exercising our skeletal muscles is important through all stages of life; however, considering the rapid decline in bone density, muscle mass, and joint health as women age, resistance exercise becomes even more important to women after menopause. As part of a comprehensive exercise program, ACSM (1,3,21,32) and the *Physical Activity Guidelines for Americans* (3,40) recommend exercising each major muscle group 2 to 3 days per week with 2 to 4 sets of 8 to 12 repetitions as most effective, although 1 set of 8 to 12 repetitions can improve strength, particularly in novice exercisers and those who are deconditioned. For novice, deconditioned exercisers, a single set of 12 to 15 repetitions of resistance exercises can be effective. With the variety of techniques, equipment, and exercise gadgets available, the fitness professional can be very creative in developing an effective resistance exercise program as long as the major muscle groups and multiple-joint and some single-joint exercises are included. For older or previously sedentary women, selectorized equipment, in which the level of resistance is adjusted by moving a pin or lever, and single-joint motion free weight exercises may be most effective because they require less skill and may pose a lower risk of injury. The use of resistance bands is recommended for women who may not have access to weights or who are not comfortable using weights and other equipment.

An important group of muscles that should be trained regularly as a woman begins perimenopause and continuing into older age is the pelvic floor muscles. Exercising the pelvic floor can improve urinary incontinence and possibly sexual function (5,16,33). Pelvic floor exercises, also called *Kegel exercises*, simply involve isometric contraction (squeezing) of the muscles of the pelvis. These exercises are commonly recommended by health care providers and, in severe cases, will be addressed in a limited program of physical therapy (16). The fitness professional can support the health care provider recommendations by encouraging the client to perform pelvic floor exercises at home one or more times a day, gradually increasing the intensity and length of contractions.

Resistance exercise is particularly important when considering the maintenance and building of BMD (3,25,27). As evidence shows, mechanical loading that results in BMD changes is site specific; therefore, the common fracture sites that particularly should be focused upon are the spine and femoral head. Because the risk for fractures is higher in postmenopausal women and in women with low BMD, the fitness professional must take care to ensure optimal safety during exercise sessions. The risk of falling can be reduced by ensuring that paths are clear, avoiding activities that require quick changes in direction and where the possibility for hard ground impact exist (e.g., outdoor running), and incorporating safety measures when participating in balance activities (e.g., lightly holding

a barre or chair). Other considerations include avoiding exercises that overly stress sites that are susceptible to fracture (i.e., avoiding medicine ball throws if there have been previous wrist fractures or a client has low BMD at the wrist). In women with osteoporosis, avoidance of spinal forward flexion is important, as the stress of this movement may result in spinal fracture (27).

Neuromotor Exercise

Older women, and possibly younger women, will benefit from exercises that incorporate balance, agility, and coordination, which facilitate engaging in activities of daily living and may reduce falls (22,32). Improving a woman's balance and strength can give her confidence to go on about daily tasks and reduce the fear of falling, thus diminishing feelings of inadequacy and dependence (7). Neuromotor exercises are highly adaptable to the individual's needs. For example, exercises, such as standing with both feet on an unstable surface (such as a thick mat) while throwing and catching a ball, four square stepping, tai chi, and yoga may elicit a training response (14,22,37). Optimal methods for progression to improve neuromotor fitness are not well established, but progression in duration and frequency can be made as tolerated.

Flexibility Exercise

Flexibility exercises for postmenopausal women should be performed on at least 2 to 3 days per week, as for all adults (1,2). Stretching of each of the major muscle-tendon groups to improve and maintain range of movement of a joint is recommended and is particularly important as a woman ages and loses flexibility. However, there are no unique considerations for the menopausal woman, so *ACSM's Guidelines for Exercise Testing and Prescription* (1) can be applied to meet individual needs.

Exercise Settings

Individual and group exercise settings can work well for women during the MT and postmenopause. A useful self-help resource that can be recommended to support group and individual exercise is *ACSM's Action Plan for Menopause* (9). Incorporating social support for exercise in group and individual exercise programs can increase a woman's enjoyment of exercise and enhance exercise adherence (18,19,36). Not all postmenopausal women have the same symptoms, fitness levels, or health concerns; thus, it is important that the fitness professional develops an individualized exercise program according to a woman's personal medical and physical activity history and goals. For group exercise, the exercise program should be modified as needed according to each woman's individual needs.

SUMMARY

Although a natural stage in a woman's life, the MT can bring on a variety of symptoms and health concerns. As women are living longer and spending more years in the postmenopausal state, it is imperative that lifestyle interventions that include exercise are incorporated to attenuate the negative health effects of menopause

and aging. The exercise professional can play an important role in improving and maintaining a woman's well-being by understanding the specific physiological and psychological needs that she may have during this stage.

References

1. ACSM's Guidelines for Exercise Testing and Prescription. 8th ed. Philadelphia (PA): Lippincott Williams & Wilkins; 2010.
2. American College of Sports Medicine Position Stand. The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness, and flexibility in healthy adults. *Med Sci Sports Exerc.* 1998;30(6):975-91.
3. American College of Sports Medicine Position Stand. Progression models in resistance training for healthy adults. *Med Sci Sports Exerc.* 2009;41(3):687-708.
4. Avis NE, Colvin A, Bromberger JT, et al. Change in health-related quality of life over the menopausal transition in a multiethnic cohort of middle-aged women: Study of Women's Health Across the Nation. *Menopause.* 2009;16(5):860-9.
5. Borello-France DF, Downey PA, Zyczynski HM, Rause CR. Continence and quality-of-life outcomes 6 months following an intensive pelvic-floor muscle exercise program for female stress urinary incontinence: a randomized trial comparing low- and high-frequency maintenance exercise. *Phys Ther.* 2008;88(12):1545-53.
6. Bruce D, Rymer J. Symptoms of the menopause. *Best Pract Res Clin Obstet Gynaecol.* 2009;23(1):25-32.
7. Bruce DG, Devine A, Prince RL. Recreational physical activity levels in healthy older women: the importance of fear of falling. *J Am Geriatr Soc.* 2002;50(1):84-9.
8. Burger HG, Dudley EC, Robertson DM, Dennerstein L. Hormonal changes in the menopause transition. *Recent Prog Horm Res.* 2002;57:257-75.
9. Bushman B, Young JC. *ACSM's Action Plan for Menopause.* 1st ed. Champaign (IL): Human Kinetics Publishers; 2005.
10. Church TS, Martin CK, Thompson AM, Earnest CP, Mikus CR, Blair SN. Changes in weight, waist circumference and compensatory responses with different doses of exercise among sedentary, overweight postmenopausal women. *PLoS One.* 2009;4(2):e4515.
11. Daley A, MacArthur C, McManus R, et al. Factors associated with the use of complementary medicine and non-pharmacological interventions in symptomatic menopausal women. *Climacteric.* 2006;9(5):336-46.
12. Daley A, MacArthur C, Mutrie N, Stokes-Lampard H. Exercise for vasomotor menopausal symptoms. *Cochrane Database Syst Rev.* 2007;4:CD006108.
13. Daley AJ, Stokes-Lampard HJ, Macarthur C. Exercise to reduce vasomotor and other menopausal symptoms: a review. *Maturitas.* 2009;63(3):176-80.
14. de Bruin ED, Murer K. Effect of additional functional exercises on balance in elderly people. *Clin Rehabil.* 2007;21(2):112-21.
15. Donnelly JE, Blair SN, Jakicic JM, Manore MM, Rankin JW, Smith BK. American College of Sports Medicine Position Stand. Appropriate physical activity intervention strategies for weight loss and prevention of weight regain for adults. *Med Sci Sports Exerc.* 2009;41(2):459-71.
16. Dumoulin C, Hay-Smith J. Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women. *Cochrane Database Syst Rev.* 2010;(1):CD005654.
17. Dunn AL, Trivedi MH, Kampert JB, Clark CG, Chambliss HO. Exercise treatment for depression: efficacy and dose response. *Am J Prev Med.* 2005;28(1):1-8.
18. Estabrooks PA. Sustaining exercise participation through group cohesion. *Exerc Sport Sci Rev.* 2000;28(2):63-7.
19. Fraser SN, Spink KS. Examining the role of social support and group cohesion in exercise compliance. *J Behav Med.* 2002;25(3):233-49.
20. Green JS, Stanforth PR, Rankinen T, et al. The effects of exercise training on abdominal visceral fat, body composition, and indicators of the metabolic syndrome in postmenopausal women with and without estrogen replacement therapy: the HERITAGE Family Study. *Metabolism.* 2004;53(9):1192-6.
21. Haskell WL, Lee IM, Pate RR, et al. Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Med Sci Sports Exerc.* 2007;39(8):1423-34.
22. Howe TE, Rochester L, Jackson A, Banks PM, Blair VA. Exercise for improving balance in older people. *Cochrane Database Syst Rev.* 2007;(4):CD004963.
23. Irving BA, Davis CK, Brock DW, et al. Effect of exercise training intensity on abdominal visceral fat and body composition. *Med Sci Sports Exerc.* 2008;40(11):1863-72.
24. Irwin ML, Yasui Y, Ulrich CM, et al. Effect of exercise on total and intra-abdominal body fat in postmenopausal women: a randomized controlled trial. *JAMA.* 2003;289(3):323-30.
25. Kohrt WM, Bloomfield SA, Little KD, Nelson ME, Yingling VR. American College of Sports Medicine Position Stand: physical activity and bone health. *Med Sci Sports Exerc.* 2004;36(11):1985-96.
26. Lovejoy JC, Champagne CM, de Jonge L, Xie H, Smith SR. Increased visceral fat and decreased energy expenditure during the menopausal transition. *Int J Obes (Lond).* 2008;32(6):949-58.
27. Management of osteoporosis in postmenopausal women: 2006 position statement of The North American Menopause Society. *Menopause.* 2006;13(3):340-67; quiz 68-9.
28. Martin CK, Church TS, Thompson AM, Earnest CP, Blair SN. Exercise dose and quality of life: a randomized controlled trial. *Arch Intern Med.* 2009;169(3):269-78.
29. McDowell MA, Fryar CD, Ogden CL. Anthropometric reference data for children and adults: United States, 1988-1994. *Vital Health Stat 11.* 2009;249:1-68.
30. Mosca L, Banka CL, Benjamin EJ, et al. Evidence-based guidelines for cardiovascular disease prevention in women: 2007 update. *J Am Coll Cardiol.* 2007;49(11):1230-50.
31. National Heart Lung and Blood Institute. Womens Health Initiative [Internet]. Bethesda (MD): National Institutes of Health, National Heart, Lung Blood Institute; 2009 [cited 2009 Nov 15]. Available from: <http://www.nhlbi.nih.gov/whi/index.html>.
32. Nelson ME, Rejeski WJ, Blair SN, et al. Physical activity and public health in older adults: recommendation from the American College of Sports Medicine and the American Heart Association. *Med Sci Sports Exerc.* 2007;39(8):1435-45.
33. Neumann PB, Grimmer KA, Deenadayalan Y. Pelvic floor muscle training and adjunctive therapies for the treatment of stress urinary incontinence in women: a systematic review. *BMC Womens Health.* 2006;6:11.
34. Ogden CL, Carroll MD, McDowell MA, Flegal KM. Obesity among adults in the United States — no statistically significant change since 2003-2004. *NCHS Data Brief.* 2007;1:1-8.
35. Pigozzi F, Rizzo M, Giombini A, Parisi A, Fagnani F, Borriore P. Bone mineral density and sport: effect of physical activity. *J Sports Med Phys Fitness.* 2009;49(2):177-83.
36. Schulz U, Pischke CR, Weidner G, et al. Social support group attendance is related to blood pressure, health behaviours, and quality of life in the Multicenter Lifestyle Demonstration Project. *Psychol Health Med.* 2008;13(4):423-37.

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37. Shigematsu R, Okura T, Sakai T, Rantanen T. Square-stepping exercise versus strength and balance training for fall risk factors. *Aging Clin Exp Res*. 2008;20(1):19–24.
38. Soules MR, Sherman S, Parrott E, et al. Stages of Reproductive Aging Workshop (STRAW). *J Womens Health Gend Based Med*. 2001;10(9): 843–8.
39. Umland EM. Treatment strategies for reducing the burden of menopause-associated vasomotor symptoms. *J Manag Care Pharm*. 2008;14(3 suppl):14–9.
40. U.S. Department of Health and Human Services. 2008 Physical Activity Guidelines for Americans. Bethesda (MD): U.S. Department of Health and Human Services; 2008.
41. Utian WH. Psychosocial and socioeconomic burden of vasomotor symptoms in menopause: a comprehensive review. *Health Qual Life Outcomes*. 2005;3:47.
42. Weismiller DG. Menopause. *Prim Care*. 2009;36(1):199–226.



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CONDENSED VERSION AND BOTTOM LINE

The menopausal transition is the stage in a woman's life where she may be faced with physical, lifestyle, and health challenges that range from more temporary symptoms, such as hot flashes, to more severe health consequences, such as cardiovascular disease and osteoporosis. The exercise professional can help to alleviate and prevent some of these consequences by encouraging physical activity and implementing a comprehensive exercise program that includes cardiorespiratory, resistance, flexibility, and neuromuscular exercise.