

OB/GYN Clinical [ALERT]

Evidence-based commentaries
on women's reproductive health

ABSTRACT & COMMENTARY

Did You Remember to Take Your Hormone Replacement? The Treatment May Not Help

By *Jeffrey T. Jensen, MD, MPH, Editor*

SYNOPSIS: Women randomized to receive postmenopausal oral estradiol therapy did not show improved memory, executive function, or global cognition, and timing of initiation of hormonal treatment did not affect the outcome.

SOURCE: Henderson VW, St John JA, Hodis HN, et al. Cognitive effects of estradiol after menopause: A randomized trial of the timing hypothesis. *Neurology* 2016;87:699-708.

The Early versus Late Intervention Trial with Estradiol (ELITE) study, a randomized, placebo-controlled, double-blind trial supported by the National Institute on Aging, was designed to test the hypothesis that time of onset of hormone therapy (HT) affects outcomes. Although the primary objective of ELITE was the relationship of HT to cardiovascular health in postmenopausal women, other outcomes were followed. The ELITE-Cog study by Henderson et al presents data on the effects of HT on cognition. The primary hypothesis of this study was that postmenopausal estrogen initiated soon after menopause (< 6 years) would affect verbal memory differently than initiation at a later time (≥ 10 years).

Conducted at the University of Southern California, the ELITE study recruited healthy (no diabetes or clinical evidence of cardiovascular disease) postmenopausal women. Enrollment was stratified according to the number of years past menopause: < 6 years (early) or

≥ 10 years (late). Subjects were randomized to receive oral 17β-estradiol (1 mg daily) or matching placebo. Women with a uterus received cyclic micronized progesterone as a 4% vaginal gel or matched placebo gel for 10 days each month. The investigators assessed cognitive skills at baseline, 2.5 years, and five years using a comprehensive neuropsychological battery that emphasized standardized tests sensitive to age-related change to assess outcomes.

Out of 643 randomized in ELITE, 567 underwent cognitive assessments at baseline and 2.5 years, and 457 contributed data to the five-year outcome. The overall adherence to the study regimen was excellent (98%). As expected, serum estradiol levels were significantly higher in the active treatment group (median 40 pg/mL [interquartile range 27-58]) compared to placebo (11 [9-14]).

Results of the cognitive tests showed no overall significant or clinically important difference in verbal memory in

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women who received estradiol compared to placebo, and no difference with respect to early or late initiation of hormonal therapy. A similar lack of effect was seen for executive function and global cognition. The authors concluded that estradiol therapy neither benefits nor harms cognitive ability regardless of time of initiation of therapy after menopause.

■ COMMENTARY

Forgetfulness and cognitive decline have long been associated with aging. Products promoted to counteract this effect include herbal supplements (*Ginkgo biloba*), antioxidant vitamin preparations, and other nutraceuticals. Although much greater scientific evidence supports an essential role for estrogen in brain function,^{1,2} we lack solid clinical data to support this indication for hormonal therapy. Nonetheless, many clinicians recommend hormonal therapy to prevent cognitive decline, and many healthy postmenopausal women not bothered by hot flushing or vaginal symptoms use therapy precisely for this reason. Observational studies documenting a decreased risk of Alzheimer's dementia provide clinical evidence to support this use.³ However, just as with cardiovascular disease, the randomized Women's Health Initiative (WHI) study challenged the conclusions of basic science and observational and database research showing brain benefits of estrogens. In the subset of women aged 65 years or older in the WHI study, HT did not improve cognitive function when compared with placebo, and more women in the HT group experienced cognitive decline.⁴ Just as with cardiovascular disease, one explanation for the negative effects observed in WHI and the positive benefits seen in observational studies may be a critical window for initiation of treatment. The randomized ELITE-Cog study was designed to evaluate this "Aging" or "Timing" hypothesis with respect to cognitive outcomes.

The findings of no difference in verbal memory or an overall cognitive benefit of estradiol treatment in the ELITE-Cog, while disappointing to advocates of hormonal therapy, demonstrate the value of doing the experiment. Living in a fact-based rather than faith-based reality requires courage. Participation in science means exposing a beautiful hypothesis to the risks of experimental validation. The fact that most hypotheses are proved wrong does not undermine the process. A vigorous debate brings us closer to the truth, and our patients need our help to distinguish between what is suspected, confirmed, and refuted by solid clinical experiments. We also must

communicate the limitations of data and the areas of future study. Facts matter, and they guide us to re-formulate hypotheses and bring us closer to the truth. The conservative approach is to accept, and act within, scientific consensus while searching for alternative explanations. The data from ELITE-Cog refute the timing hypothesis that early initiation of estradiol therapy within six years of the onset of menopause will improve verbal memory and cognitive function.

The results of ELITE-Cog are consistent with KEEPS-Cog.⁵ The KEEPS study randomized recently postmenopausal women to receive transdermal estradiol or oral conjugated equine estrogens (with cyclic micronized progesterone in women with a uterus). Like the ELITE study, the parent KEEPS study looked at cardiovascular outcomes, and KEEPS-Cog evaluated cognitive outcomes. Participants averaged 53 years of age, and were 1.4 years past their last menstrual period. As with ELITE-Cog, no treatment-related benefit of HT was seen with respect to cognitive function.

Taken together, these results do not support use of estrogen therapy to prevent cognitive decline in postmenopausal women. However, research should continue in this field. Some brain researchers believe that susceptibility for irreversible cognitive effects may manifest in the perimenopausal transition.⁶ Would even earlier initiation of therapy improve outcomes? Others suggest a "Goldilocks" effect for estrogen therapy; too little gives no benefit, too much harm (e.g., increased thrombosis risk).⁷ Perhaps the estrogen exposure in both ELITE-Cog and KEEPS-Cog was insufficient for benefit? The median estradiol levels on treatment were around 40 pg/mL. As I have previously noted, one result of the WHI has been a consistent pressure to find the "lowest effective dose" of estrogen. While levels of estradiol around 40 pg/mL are considered bone protective, this may be insufficient to produce cardiovascular or brain benefits. I am not a fan of the minimum dose approach that has been advanced by many following the WHI. Keeping serum estradiol in the normal mid-follicular cycle range of 50-80 pg/mL seems more appropriate. Prescribing estradiol allows you to check a level to assist with management of patients. Finally, the timeline for assessment of outcomes may have been too short to demonstrate a benefit. In Cache County, only use of HT for more than 10 years provided maximal protection from Alzheimer's disease.³

However, all of these are hypotheses, and we need to deal with facts, not faith. While we

wait for more evidence, we should communicate to our patients that the evidence is insufficient to recommend the use of postmenopausal HT solely for cognitive benefit. ■

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ABSTRACT & COMMENTARY

Who Needs an Endometrial Biopsy?

By Rebecca H. Allen, MD, MPH

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Dr. Allen reports she is a Nexplanon trainer for Merck, and has served as a consultant for Bayer and Pharmanest.

SYNOPSIS: In this retrospective cohort study of premenopausal women with abnormal uterine bleeding, obesity, as opposed to age, was the most significant predictor of complex hyperplasia or cancer on endometrial biopsy.

SOURCE: Wise MR, Gill P, Lensen S, et al. Body mass index trumps age in decision for endometrial biopsy: Cohort study of symptomatic premenopausal women. *Am J Obstet Gynecol* 2016;215:598.e1-8.

This is a retrospective cohort study conducted in New Zealand from 2008 to 2014. Women were included if they were 55 years of age or younger, had a history of abnormal uterine bleeding, were not menopausal (either by history, or amenorrhea \geq 6 months, or serum follicle-stimulating hormone level $>$ 20 IU/L), and underwent an endometrial biopsy. Exclusions were women with a known history of endometrial cancer or complex hyperplasia before 2008. The primary outcome was the histologic diagnosis of complex hyperplasia, complex atypical hyperplasia, or endometrial cancer. Data were collected from the medical record, including measured height/weight within one year of the biopsy, age, parity, menstrual history, medical history, family history of cancer, socioeconomic status, and use of hormone therapy. Hemoglobin, pelvic ultrasound, and hysterectomy results also were recorded, if performed.

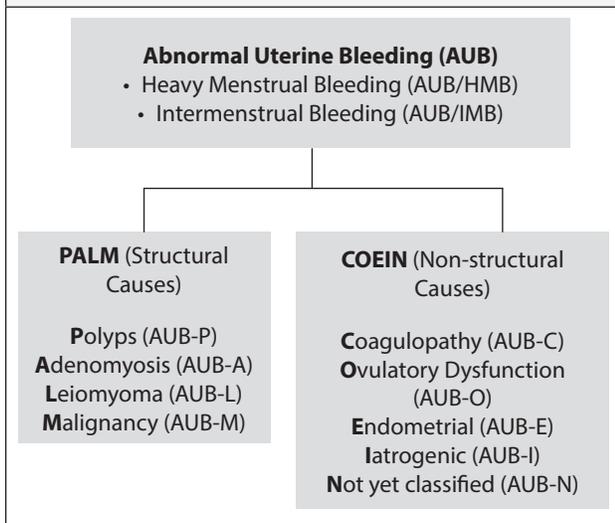
A total of 916 women met the inclusion and exclusion criteria. Half ($n = 451$) of the women had a body mass index (BMI) ≥ 30 kg/m², and 85% of the subjects underwent Pipelle endometrial biopsy, 22% had sharp curettage (presumably a dilation and curettage in the operating room), and 7% had both. The mean age was 43.7 ± 6.4 in the non-obese group and 42.0 ± 7.2 in the obese group. Of 840 women with sufficient tissue for diagnosis, 41 (4.9%) women were diagnosed with endometrial hyperplasia with or without atypia or cancer. In univariate analysis, women of Indian and Pacific ethnicity had a higher odds of having complex hyperplasia or cancer compared to European women (odds ratio [OR], 6.21; 95% confidence interval [CI], 2.11-18.32). However, this variable was confounded by the fact that 92% of the women of Indian and Pacific ethnicity were obese; therefore, BMI was chosen for the multivariate model because it was more generalizable and biologically plausible. Other variables associated with the outcome were nulliparity (OR, 2.51; 95% CI, 1.25-5.05), anemia (OR, 2.38; 95% CI, 1.25-4.56), and

thickened endometrium on ultrasound (OR, 4.04; 95% CI, 1.69-9.65). In the multivariable analysis, after adjusting for age, anemia, and nulliparity, obese women had higher odds of having complex hyperplasia or cancer compared to non-obese women (adjusted OR, 4.00; 95% CI, 1.36-11.74), while overweight women showed no increased risk. Nulliparity and anemia remained significant predictors in the multivariate model.

■ COMMENTARY

Abnormal uterine bleeding (AUB) is one of the most common reasons for referral to the gynecologist and is divided into heavy menstrual bleeding and intermenstrual bleeding. The cause of AUB is classified by the PALM-COEIN terminology. (See Figure 1.) The decision whether to perform an endometrial biopsy to rule out endometrial hyperplasia or cancer is informed by clinical factors. Risk factors for endometrial cancer include age, obesity, nulliparity, infertility, late-onset menopause, diabetes, and hypertension. The number of new cases of endometrial cancer in the United States was 25.4 per 100,000 women per year in 2013.¹ The American College of Obstetricians and Gynecologists recommends endometrial biopsy as a first-line test in women age 45 and older.² For younger women, it recommends that biopsy be performed in those with a history of unopposed estrogen (as in obesity or polycystic ovary syndrome), failed medical management, and persistent abnormal uterine bleeding. The National Institute for Health and Care Clinical Guideline on heavy menstrual bleeding in the United Kingdom recommends a biopsy in women with persistent intermenstrual bleeding, women aged 45 and older, or those experiencing treatment failure.³ This study reported on the strong role of obesity as a risk factor and recommends changing guidelines to reflect its prominent influence on the development of endometrial hyperplasia and cancer.

Figure 1: Abnormal Uterine Bleeding (AUB)



The same authors published a systematic review earlier in the year evaluating obesity and endometrial hyperplasia and cancer in premenopausal women. In this review, they found nine studies from eight countries that were all case-control design. A total of 1,250 cases and 4,957 controls were reported. Only one study used endometrial hyperplasia as an endpoint; the remainder utilized endometrial cancer. They were able to perform a pooled analysis with six of the studies and found a dose-response relationship with obesity and increased risk of endometrial cancer. For BMI ≥ 25 kg/m², the pooled OR was 3.85 (95% CI, 2.53-5.84); for BMI ≥ 30 kg/m², the pooled OR was 5.25 (95% CI, 4.00-6.90); and for BMI ≥ 40 kg/m², the pooled OR was 19.79 (95% CI, 11.18-35.03).

The main clinical question is: how many endometrial

biopsies must be performed in premenopausal obese women with abnormal uterine bleeding to detect one case of endometrial hyperplasia or cancer? In the current study, there were 12 (1.4%) cases of endometrial cancer, nine (1.1%) cases of complex hyperplasia with atypia, and 20 (2.4%) cases of complex hyperplasia without atypia. Among obese women, 31 of 451 (7.4%) were diagnosed with endometrial hyperplasia or cancer compared to four of 208 (1.9%) overweight women and six of 257 (2.3%) normal weight women. The authors didn't calculate a "number needed to screen" to detect a case of endometrial hyperplasia or cancer. Nevertheless, we currently have a blanket recommendation to screen all women age 45 years and older for endometrial hyperplasia or cancer if they present with abnormal uterine bleeding. The reasoning behind this age cutoff is that 1.6% of all endometrial cancer cases occur among women 20-34 years of age, 5.4% between the ages of 35-44 years, and 17.2% occur among women 45-54 years of age, with the remainder occurring at older ages and a median age of diagnosis of 62 years. Nevertheless, I definitely see the logic of using BMI as an additional risk stratification measure in younger women, with a BMI ≥ 30 kg/m² prompting an endometrial biopsy in women with abnormal uterine bleeding. In this way, even if endometrial hyperplasia rather than cancer is diagnosed, we actually have the opportunity to prevent progression to cancer with progestin treatment or hysterectomy, depending on the clinical circumstances. ■

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ABSTRACT & COMMENTARY

Laborists: How Will It Affect Care?

By John C. Hobbins, MD

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Dr. Hobbins reports no financial relationships relevant to this field of study.

SYNOPSIS: A recent study has shown a decrease in rates of induction, cesarean section, and preterm birth in hospitals after instituting a laborist model, compared with matched-control hospitals using the traditional model.

SOURCE: Srinivas SK, Small DS, Macheras M, et al. Evaluating the impact of the laborist model of obstetric care on maternal and neonatal outcomes. *Am J Obstet Gynecol* 2016;215:770 e1-9.

There is a growing movement in this country to compartmentalize the management of inpatient from outpatient care. Patients admitted to the hospital are handed off to physician hospitalists, who are then in charge of their care until discharge. This happens often without input from the patients' primary care physicians, or, in pregnancy, their obstetricians. In the latter case, the hospitalist becomes a "laborist." The movement was initiated to improve

efficiency and safety (by avoiding fatigue). Yet, until now, data have been scarce to demonstrate that these goals have been met.

Srinivas et al collected information from the National Center/Quality Analytic Services Database on patient outcomes before and after three years of experience with a laborist model. Each of eight hospitals who started this

system between 2000 and 2010 were chosen and compared to two carefully matched control hospitals that did not have this type of system in place during the same time span. Rates of the following were analyzed: cesarean sections, chorioamnionitis, inductions of labor, preterm birth (PTB), lengthy hospital stays, five-minute Apgar scores < 7, birth asphyxias, birth injuries, and neonatal deaths.

Data were analyzed from 550,000 patients in the 24 hospitals chosen for the study. In concert with the rising trend in the United States during the study periods, the cesarean section rate rose in both the laborist and control hospitals. However, the rise was 33% less in the former group than in the control group (1.07% vs. 3.22%; $P = 0.011$). Also, the labor induction rate rose during the same study window but was 17% less in the laborist hospitals vs. controls (0.68% vs. 3.9%; $P = 0.09$). The only difference in the above neonatal outcome measures was an actual drop in PTB in the laborist group by 0.68%, while in the control group the rate increased by an average of 0.99% ($P = 0.04$) over the study period. Breaking this down further, the investigators found the major difference to be in spontaneous PTBs, rather than in medically indicated early deliveries. There were no statistically significant differences between groups in any of the other outcomes studied.

■ COMMENTARY

This study suggests that there may be a slight but significant reduction in inductions, cesarean sections, and PTBs when a laborist model is introduced, with seemingly no downside

— at least, regarding the maternal events and neonatal outcomes that were evaluated. The authors postulated fewer inductions led to lower cesarean section rates. Fewer inductions also beget fewer PTBs, because in the control group some of these inductions could have been in patients in the “iffy” gestational age range that could overlap into the 36-36/6 week “late PTB” category. The authors then speculated, and I think appropriately, that these inductions in the control hospitals might have been booked for times that were more convenient for the patient or the provider. The study design had limitations. Based on the only data that were available, the authors could not document their late PTB hypothesis and, although they felt they had weeded out many of the confounding variables, they could not address the possibility that laborist models vary between hospitals and that certified nurse midwives, often working in conjunction with laborists, might have had a greater effect than the laborist alone.

One possible downside often glossed over is the emotional effect that this type of compartmentalized care has on patients who may be still expecting the continuity once provided by their primary caregiver. However, it seems that today’s patients may be even more adaptable to this model than their older providers (who for years have willingly provided continuity of care for their laboring patients), as long as they have been apprised of the handoff model when obstetrical care is first undertaken. Time will tell how well this plays out. ■

ABSTRACT & COMMENTARY

Marijuana Use and Pregnancy

By *Rebecca H. Allen, MD, MPH*

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Dr. Allen reports she is a Nexplanon trainer for Merck, and has served as a consultant for Bayer and Pharmanest.

SYNOPSIS: Marijuana use in pregnancy increased 62% from 2002 to 2014, especially among women 18-25 years of age.

SOURCE: Brown QL, Sarvet AL, Shmulewitz D, et al. Trends in marijuana use among pregnant and nonpregnant reproductive-aged women, 2002-2014. *JAMA* 2016; Dec. 19. doi: 10.1001/jama.2016.17383 [Epub ahead of print].

This is a retrospective cohort study conducted using data from the United States National Survey on Drug Use and Health from 2002 to 2014. Sponsored by the Substance Abuse and Mental Health Services Administration, this is an annual nationwide survey involving interviews with approximately 70,000 randomly selected individuals aged 12 years and older across the United States. The participants privately enter their responses directly onto a laptop computer supplied by an in-person interviewer. Response rates have averaged 75% or higher since 2002. Lifetime use of marijuana or hashish was measured, as well as how recently the last use occurred (within the past 30 days, more than 30 days ago but within the past 12 months, or more than 12 months ago). Pregnant and non-pregnant women were compared by age (18-25 years and 26-44 years), and

differences in trends over time were examined.

A total of 200,510 women were surveyed, with 29.5% aged 18-25 years and 70.5% aged 26-44 years. Of the total, 61.0% were white, 13.7% black, 17.2% Hispanic, and 8.1% other race/ethnicity. About 60% had some college education and 5.3% were pregnant. After controlling for age, race, income, and education, the adjusted prevalence of past-month marijuana use increased from 2.37% (95% confidence interval [CI], 1.85%-3.04%) in 2002, to 3.85% (95% CI, 2.87%-5.18%) in 2014 (prevalence ratio [PR], 1.62; 95% CI, 1.09-2.43). The corresponding numbers for non-pregnant women were 6.29% (95% CI, 6.02%-6.57%) in 2002, to 9.27% (95% CI, 8.90%-9.65%) in 2014 (PR, 1.47; 95% CI, 1.38-1.58). The adjusted

prevalence of past-month marijuana use was highest among those aged 18-25 years, reaching 7.47% (95% CI, 4.67%-11.93%) in 2014, significantly higher ($P = 0.02$) than among those aged 26-44 years (2.12%; 95% CI, 0.74%-6.09%).

■ COMMENTARY

Marijuana always has been the most common illicit drug used during pregnancy. With the growing number of states permitting medical marijuana and recreational marijuana use, we have started to see an increasing number of women using marijuana during pregnancy. Although the prevalence of past-month marijuana use among pregnant women overall in 2014 was only 3.85%, it was almost 7.5% among women aged 18-25 years. The methodology of the study permitted private answers to survey questions, which hopefully mitigated any social desirability bias. The concern in pregnancy is that women may turn to marijuana for the treatment of nausea and vomiting. In all states where medical marijuana is legal, nausea is a medically approved indication. One small study from Hawaii found that women who reported severe nausea during pregnancy were significantly more likely to report marijuana use during pregnancy (3.7% vs. 2.3%; PR = 1.63; 95% CI, 1.08-2.44).¹ Given that most nausea and vomiting of pregnancy occurs in the first trimester, women are using this substance at a vulnerable period in fetal development.

Marijuana contains various cannabinoids, the main agent and the most commonly studied of which is tetrahydrocannabinol (THC). THC is known to cross the placenta and be present in breast milk.² The effects of marijuana use in pregnancy are difficult to study because there are many confounding factors. Women who use marijuana also may smoke tobacco, use alcohol or other drugs, and have socioeconomic challenges that also can contribute to adverse pregnancy outcomes. As an example, one study of pregnant women found that marijuana users had lower levels of education, a lower household income, and were less likely to use folic acid supplements than

non-users.³ In addition, most studies on marijuana use in pregnancy rely on self-reporting, which is vulnerable to bias. Also, the potency of marijuana and the concentration of THC will vary depending on the product used.

Although marijuana use is not thought to cause structural congenital malformations, it has been linked to negative effects on brain development.² The fetal brain contains cannabinoid receptors, and endogenous cannabinoids play a role in brain development. Experiments in animals have shown a detrimental effect on normal brain development of exogenous THC. In humans, there is some evidence of effects on children in terms of impaired higher-order executive functions, such as visual-motor coordination, decreased attention span, and behavioral problems.⁴ Although there are limitations to the data on marijuana use in pregnancy, the American College of Obstetricians and Gynecologists recommends against use of marijuana during pregnancy.² It certainly makes sense that if smoking tobacco should be avoided, then marijuana should be avoided as well. Women should be asked about marijuana use along with querying their use of tobacco, alcohol, and other drugs when presenting for prenatal care. Women who use marijuana should be counseled to stop using it during pregnancy. There are other, better-studied alternatives to treat nausea and vomiting. The healthcare and legal system also should allow for free reporting of substance use without women fearing civil or criminal penalties from disclosing use during their OB/GYN care. Clearly, more data are needed that can tease the effects of marijuana use during pregnancy so we can better understand and counsel women appropriately. ■

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SPECIAL FEATURE

Physical Activity, Exercise, Strength, Aging, and the Pelvic Floor

By Chiara Ghetti, MD

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Dr. Ghetti reports no financial relationships relevant to this field of study.

It's a new year, and how many of us have New Year's resolutions to increase our exercise in 2017? Exercise classes at my neighborhood studio doubled in size this past week — likely because of many renewed hopes of fitness. My own personal dedication to movement and physical exercise has brought me a new appreciation of the capacity

and interrelatedness of our human body and the maladies caused by lack of exercise. As a subspecialist in female pelvic medicine and reconstructive surgery, I struggle daily with how to best assist my patients in finding wellness and embracing a lifestyle that includes physical exercise. While exploring broad themes of exercise and obesity, this special

feature will focus on physical activity in relationship to the pelvic floor.

There are numerous documented physical and mental health benefits to physical activity affecting overall well-being, health-related quality of life, and aging.¹ A 2009 Cochrane review also concluded that exercise has a positive effect on body weight and cardiovascular disease risk factors in individuals who are overweight or obese, and that exercise improves health, even if no weight is lost.² In 2010, the World Health Organization (WHO) published its recommendations for levels of activity for children, young adults, and older adults. It recommends that individuals 18 years or older should engage in at least “150 minutes of moderate-intensity aerobic physical activity throughout the week and for additional health benefits, older adults should increase their moderate-intensity aerobic physical activity to 300 minutes per week.”³ The WHO lists physical inactivity as a leading risk factor for global mortality, following high blood pressure (13%) and tobacco use (9%) and equal to high blood glucose (6%).³ Increased inactivity is due in part to increasingly sedentary jobs and sedentary behavior at home and during leisure time, as well as inactive methods of transportation.

The rise in global inactivity undoubtedly is interrelated to the rapidly rising number of individuals who are overweight and obese. Worldwide in 2014, 39% of adults aged 18 years and older were overweight, and 13% were obese.³⁻⁵ Globally, a large proportion of the cost and health burden of obesity can be attributed directly to its associated comorbidities, specifically diabetes, cardiovascular heart disease, certain cancers, and musculoskeletal disorders.^{3,5} Globally, women are more likely to be overweight and obese than men. In the United States alone, 68.8% of adults older than 20 years of age are considered overweight or obese. The prevalence of obesity in the United States is 37% and is similar between men and women.⁶

We know pelvic floor disorders are very common; 25% of women report symptoms of urinary incontinence, fecal incontinence, or pelvic organ prolapse.⁷ The link between obesity and lower urinary symptoms and stress urinary incontinence has been well documented.^{8,9} Although obesity frequently is quoted as a risk factor for pelvic organ prolapse, its role is less clear, with only a few studies suggesting a positive association.⁹ Several studies have demonstrated the benefits of weight loss on urinary incontinence, with significant improvement in urinary incontinence symptoms seen following 5% reduction in body weight.⁹ In addition, several observational studies have shown improvements in urinary incontinence following weight loss surgery.⁹ It is unclear whether weight loss produces similar effects in obese older women with urinary incontinence.

Given these associations and the knowledge that physical activity can help decrease obesity, what is the relationship between physical activity and pelvic floor disorders? In 2016, Nygaard and Shaw reviewed the literature regarding physical activity and the pelvic floor.¹⁰ Most of the studies

identified in their review included small numbers of subjects and were cross-sectional in design. The majority measured physical exercise by patient-reported questionnaire. With regard to urinary incontinence, the main findings indicated that urinary incontinence is frequent in women of all ages during physical exercise and more commonly is associated with high-impact activity. However, mild-to-moderate physical activity decreases the risk of developing urinary incontinence. As a corollary, there are studies documenting the negative effect of both stress and urge incontinence on women's ability to exercise and to work. Nygaard found no association between exercise and prolapse; however, there are associations between strenuous occupational activities and prolapse. As our patients with prolapse describe, there can be an increase in degree of prolapse following short episodes of exercise, standing for long periods, or straining. Overall, data are limited regarding whether strenuous activity in youth can increase the risk of urinary incontinence or prolapse as an adult. Nygaard and Shaw concluded that most physical exercise is not harmful to the pelvic floor and there are many health benefits to exercise.

Middlekauff et al investigated the effect of acute and chronic strenuous physical exercise on pelvic floor muscle strength and support in nulliparous women.¹¹ In this study, of the 70 nulliparous women enrolled, 35 were involved in habitual strenuous exercise and 35 were not. Participants involved in regular strenuous exercise were heavier, had lower percent body fat, and had higher handgrip strength. In both groups, maximal vaginal descent (defined as the greatest value of anterior, posterior, or apical support) increased, and vaginal resting pressure (measured using a perineometer) decreased. In neither group did maximal pelvic floor strength change significantly after exercise. The authors found that chronic strenuous exercise did not pose negative effects on pelvic floor support or strength, and although women in the strenuous exercise group had stronger grip strength, this did not translate into greater pelvic floor strength.

Suskind et al attempted to prospectively evaluate the relationships between body composition, muscle strength, and urinary incontinence in older women. In this prospective, community-dwelling, observational cohort study, the Health, Aging, and Body Composition study, 1,475 women aged 70-75 were enrolled. Urinary incontinence was assessed through structured self-report questions used in other larger epidemiologic studies. Body mass index (BMI), grip, and quadriceps strength also were assessed as well as walking speed, lean body mass, and whole body fat mass. The authors found that elevated BMI and greater adiposity are important risk factors for urinary incontinence in older women, as they are for younger women. The authors found that in this group of older women, women with a 5% or greater decrease in grip strength had higher odds of new or persistent stress urinary incontinence. Subjects had lower odds of new or persistent stress urinary incontinence if they demonstrated a 5% or greater decrease in BMI, another finding similar to studies in younger women. The authors concluded that in women ages 70 years and older, changes in body composition and grip strength over three years are associated with changes in

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stress urinary incontinence symptoms over time but not in symptoms of urge incontinence.

These studies point to the importance of physical exercise. However, we have yet to consider the effect of pregnancy and childbirth on exercise and the pelvic floor, as well as the cumulative effects of long-term obesity, core muscle weakness, and dysfunctional movement patterns alongside aging on the pelvic floor. Despite these many gaps in our understanding regarding exercise and the pelvic floor, physical activity is a strong modifiable risk factor that can significantly affect women's overall wellbeing and quality of life as well as the risk of urinary incontinence symptoms. Despite my narrow scope of medical practice, my New Year's resolution is to counsel and encourage every woman I see to increase her daily physical activity for both her fundamental and basic health, as well as for her pelvic floor. ■

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CME/CE QUESTIONS

1. **The ELITE-Cog study provided evidence that initiation of postmenopausal estrogen therapy:**
 - a. within six years of menopause will reduce the risk of dementia.
 - b. more than 10 years after onset of menopause increases verbal memory scores.
 - c. does not improve or diminish verbal memory or cognition.
 - d. improved verbal memory and conversational fluency only in women with college degrees.
2. **In the study by Wise et al on obesity and risk of endometrial hyperplasia or cancer in premenopausal women, which of the following was *not* a significant risk factor in the multivariable analysis?**
 - a. Obesity
 - b. Nulliparity
 - c. Age
 - d. Anemia
3. **In which of the following were there differences between the laborers model and the traditional model?**
 - a. Low five-minute Apgar scores
 - b. Rate of cesarean section
 - c. Longer hospital stays
 - d. Birth injury
4. **In the study by Shmulewitz et al., the prevalence of marijuana use was higher among women aged 26-44 years.**
 - a. True
 - b. False
5. **Physical activity has been shown to:**
 - a. significantly increase the risk of pelvic organ prolapse.
 - b. increase the risk of stress incontinence.
 - c. lead to many health benefits.
 - d. be associated with increased pelvic floor strength.

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