

# Abstracts of Articles Authored or Coauthored by Permanente Physicians

Selected by Daphne Plaut, MLS, Librarian, Center for Health Research

*From Southern California:*

## **The relationship of sex to asthma prevalence, health care utilization, and medications in a large managed care organization.**

*Schatz M, Camargo CA Jr. Ann Allergy Asthma Immunol 2003 Dec;91(6):553-8.*

**BACKGROUND:** Age-related sex differences in asthma hospitalizations and emergency department (ED) visits have been reported, but relationships of these differences to disease prevalence and outpatient management have not been defined.

**OBJECTIVE:** To define the relationships of sex to asthma-related health care utilization and medications, accounting for age-related differences in asthma prevalence.

**METHODS:** Computerized data from Southern California Kaiser Permanente were used to identify asthmatic patients, aged 2 to 64 years, enrolled continuously during 1999 and 2000. Age-specific asthma prevalence in 1999 was calculated to identify ages of male or female predominance. Males and females were compared with regard to asthma-related health care utilization outcomes (outpatient clinic visits, ED visits, and hospitalizations) and medication use (beta-agonists, inhaled steroids, and oral steroids). Hospitalizations, ED visits, and oral steroid use were considered markers of disease severity.

**RESULTS:** Of the 60,694 subjects, the female-male prevalence ratio was approximately 35:65 at each age between 2 and 13 years, it was inverse (65:35) between the ages of 23 and 64 years, and prevalences were relatively similar at the ages of 14 to 22 years. In patients aged 2 to 13 years, most utilization and medication variables were significantly greater in males ( $p < .01$ ). Females aged 14 to 22 years had more outpatient and ED visits and used more oral steroids than males. In patients aged 23 to 64 years, all utilization variables were significantly greater in females,

except beta-agonist use and mean inhaled steroid dispensings.

**CONCLUSIONS:** Asthma utilization and severity appear greater in males aged 2 to 13 years, somewhat greater in females aged 14 to 22 years, and definitely greater in females aged 23 to 64 years. The mechanisms for these striking sex differences merit further investigation.

**CLINICAL IMPLICATION:** Asthma is known to be more common in males under age 15 and in females older than age 15. It has been less clear that disease severity follows the same age distribution, above and beyond the effect of prevalence. The most important finding in this study is that adult women experience more severe asthma, even after accounting for prevalence, management, and other severity factors. Female gender needs to be considered an independent severity marker in adults and management intensity adjusted accordingly. —MS

*From the Northwest:*

## **Income inequality and pregnancy spacing.**

*Gold R, Connell FA, Heagerty P, Bezruchka S, Davis R, Cawthon ML. Soc Sci Med 2004 Sep;59(6):1117-26.*

We examined the relationship between county-level income inequality and pregnancy spacing in a welfare-recipient cohort in Washington State. We identified 20,028 welfare-recipient women who had at least one birth between July 1, 1992, and December 31, 1999, and followed this cohort from the date of that first in-study birth until the occurrence of a subsequent pregnancy or the end of the study period. Income inequality was measured as the proportion of total county income earned by the wealthiest 10% of households in that county compared to that earned by the poorest 10%. To measure the relationship between income inequality and the time-dependent

risk (hazard) of a subsequent pregnancy, we used Cox proportional hazards methods and adjusted for individual- and county-level covariates. Among women aged 25 and younger at the time of the index birth, the hazard ratio (HR) of subsequent pregnancy associated with income inequality was 1.24 (95% CI: 0.85, 1.80), controlling for individual-level (age, marital status, education at index birth; race, parity) and community-level variables. Among women aged 26 or older at the time of the index birth, the adjusted HR was 2.14 (95% CI: 1.09, 4.18). While income inequality is not the only community-level feature that may affect health, among women aged 26 or older at the index birth it appears to be associated with hazard of a subsequent pregnancy, even after controlling for other factors. These results support previous findings that income inequality may impact health, perhaps by influencing health-related behaviors.

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*From the Northwest:*

## **Cost-effectiveness of a tailored intervention to increase screening in HMO women overdue for Pap test and mammography services.**

*Lynch FL, Whitlock EP, Valanis BG, Smith SK. Prev Med 2004 Apr;38(4):403-11.*

**BACKGROUND:** Research has established the societal cost-effectiveness of providing breast and cervical cancer screening to women. Less is known about the cost of motivating women significantly overdue for services to receive screening.

**METHODS:** In this intent-to-treat study, a total of 254 women, aged 52-69, who were overdue for both Pap test and mammography, were randomized to two groups, a tailored, motivational outreach or usual care. For ef-

fectiveness, we calculated the percent of women who received both services within 14 months of randomization. We used a comprehensive cost model to estimate total cost, per-participant cost, and the incremental cost-effectiveness of delivering the outreach intervention from the health plan perspective. We also conducted sensitivity analyses around two key parameters, target population size and level of effectiveness.

**RESULTS:** Compared with usual care, outreach ( $p = 0.006$ ) screened significantly more women. The intervention cost US \$167.62 (2000 US dollars) for each woman randomized to outreach, and incremental cost-effectiveness of outreach over usual care was US \$818 per additional woman screened. Sensitivity analyses estimated incremental cost-effectiveness between US \$19 and US \$90 per additional woman screened.

**CONCLUSIONS:** Larger health plans can likely increase Pap test and mammography services in this population for a relatively low cost using this outreach intervention.

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*From the Northern California, Southern California, Northwest, Hawaii, and Colorado:*

**Reason for late-stage breast cancer: absence of screening or detection, or breakdown in follow-up?**

*Taplin SH, Ichikawa L, Yood MU, et al. J Natl Cancer Inst 2004 Oct 20;96(20):1518-27.*

**BACKGROUND:** Mammography screening increases the detection of early-stage breast cancers. Therefore, implementing screening should reduce the percentage of women who are diagnosed with late-stage disease. However, despite high national mammography screening rates, late-stage breast cancers still occur, possibly because of failures in screening implementation.

**METHODS:** Using data from seven health care plans that included 1.5 million women aged 50 years or older, we conducted retrospec-

tive reviews of chart and automated data for three years before 1995-99 diagnoses of late-stage (metastatic and/or tumor size  $\geq 3$  cm; case subjects,  $n = 1347$ ) and early-stage breast cancers (control subjects,  $n = 1347$ ). We categorized the earliest screening mammogram during the period 13-36 months before diagnosis as none (absence of screening), negative (absence of detection), or positive (potential breakdown in follow-up). We compared the proportion of case and control subjects in each category of screening implementation and estimated the likelihood (odds ratio [OR] with 95% confidence intervals [CIs]) of late-stage breast cancer. We also evaluated demographic characteristics associated with absence of screening in women with late-stage disease. All statistical tests were two-sided.

**RESULTS:** Absence of screening, absence of detection, and potential breakdown in follow-up were distributed differently among case (52.1%, 39.5%, and 8.4%, respectively) and control subjects (34.4%, 56.9%, and 8.8%, respectively) ( $p = .03$ ). Among all women, the odds of having late-stage cancer were higher among women with an absence of screening (OR = 2.17, 95% CI = 1.84 to 2.56;  $p < .001$ ). Among case patients, women were more likely to be in the absence-of-screening group if they were aged 75 years or older (OR = 2.77, 95% CI = 2.10 to 3.65), unmarried (OR = 1.78, 95% CI = 1.41 to 2.24), or without a family history of breast cancer (OR = 1.84, 95% CI = 1.45 to 2.34). A higher proportion of women from census blocks with less education (58.5% versus 49.4%;  $p = .003$ ) or lower median annual income (54.4% versus 42.9%;  $p = .004$ ) were in the absence-of-screening category compared with the proportion for the other two categories combined.

**CONCLUSIONS:** To reduce late-stage breast cancer occurrence, reaching unscreened women, including elderly, unmarried, low-income, and less-educated women, should be made a top priority for screening implementation.

*Taplin SH, Ichikawa L, Yood MU, et al. Reason for late-stage breast cancer: absence of screening or detection,*

*or breakdown in follow-up? Journal of the National Cancer Institute 2004; 96(20):1518-27, by permission of Oxford University Press.*

**CLINICAL IMPLICATION:** One advantage of integrated health plans like KP is existence of data such as information enabling us to identify women who have not had mammography screening for two years. These women can be reminded to get their mammogram or to come in for a discussion of mammography with their physician. Our study suggests that such activity may be the most important one for reducing late-stage cancer and require less correspondence than sending reminders to all age-eligible women. Our study also suggests that more should be done to improve radiologist's interpretations. -ST

*From Hawaii:*

**Dairy intake is associated with lower body fat and soda intake with greater weight in adolescent girls.**

*Novotny R, Daida YG, Acharya S, Grove JS, Vogt TM. J Nutr 2004 Aug;134(8):1905-9.*

Body fat and weight of 9- to 14-year-old girls ( $n = 323$ ) from KP were studied in relation to age, ethnicity, and physical activity. Mean age, calcium intake, weight, and iliac skinfold thickness were  $11.5 \pm 1.4$  years,  $736.5 \pm 370.7$  mg/d,  $44.6 \pm 13.0$  kg, and  $12.4 \pm 6.1$  mm, respectively. Multiple regression with age, ethnicity, height, Tanner breast stage, physical activity, energy, soda, and calcium intake explained 17% of the variation in iliac skinfold thickness. Calcium intake, age, and physical activity were significantly negatively associated with iliac skinfold thickness whereas height, Tanner breast stage, and Pacific Islander ethnicity were significantly positively associated ( $p < 0.0001$ ,  $R(2) = 0.165$ ). Substituting total calcium with dairy and non-dairy calcium in separate models accounted for 16 and 15% of the variance, respectively ( $p < 0.0001$ , both models); 1 mg of total and dairy calcium was significantly associated with 0.0025 mm ( $p = 0.01$ ) and 0.0026 mm ( $p = 0.02$ ) lower iliac skinfold thickness. Thus, one milk serving was associated with 0.78 mm iliac skinfold thickness. The interaction of Asian

ethnicity and dairy intake was significant ( $p = 0.027$ ). Nondairy calcium was not associated with weight or iliac skinfold thickness. Soda intake was significantly positively associated with weight in both models ( $p = 0.01$ , both models). Decreasing soda and increasing dairy consumption among Asians may help maintain body fat and weight during adolescence. *Reprinted with permission from The American Society for Nutritional Sciences.*

**CLINICAL IMPLICATION:** Our study suggests that replacing soda with dairy and other calcium-rich foods may help prevent overweight, especially of the midregion of the body, which is known to be important to prevent chronic diseases. This association was true for adolescents and especially for Asians and was stronger for dairy than nondairy foods. Potential for a slim waist provides another reason to recommend calcium and dairy intake to young people of diverse backgrounds. –RN

*From Southern California:*  
**Rates of multiple birth before and after fortification of food with folic acid, 1994-2000 [abstract].**

Lawrence JM, Watkins M, Chiu V, Erickson JD, Pettiti DB. *Am J Epidemiol* 2004 Jun 1;159(11 Suppl):S86.

**BACKGROUND:** Fortification of foods with folic acid (FA) began in 1998. The potential effect of fortification on rate of multiple births continues to be a source of concern.

**METHODS:** Women who had a live birth in 11 hospitals of a large managed health care organization from January 1, 1994 through December 31, 2000 were identified using the perinatal services system (PSS) database. We ascertained multiple births and the use of ovulation-inducing drugs (clomiphene citrate and menotropins) by reviewing computer-stored data. A random sample of medical records was reviewed to determine whether the use of other assisted reproductive technologies (ART) had changed during the same period.

**RESULTS:** There were 224,963 live births during the study period; births per year ranged from a low of 27,119 in 1994 to a high of 35,408 in 2000. We identified 3035 multiple births for a rate of 1.41 multiple births per

100 live births during the seven-year study period. The rate of multiple births per 100 live births remained stable over the seven years of the study (1.36, 1.40, 1.44, 1.42, 1.34, 1.41, and 1.48, respectively). When women who had a prescription for an ovulation-inducing drug filled within 12 months of the birth (9.6% of the multiple births) were excluded, the overall rate of multiple birth was 1.27. (1.27, 1.26, 1.32, 1.32, 1.24, 1.24, 1.26, respectively). Use of ART increased through 1997 but decreased thereafter.

**DISCUSSION:** This study shows that there is no temporal relationship between the multiple birth rate and the implementation of food fortification with folic acid in the United States in this large population-based study.

Lawrence JM, Watkins M, Chiu V, Erickson JD, Pettiti DB. *Rates of multiple birth before and after fortification of food with folic acid, 1994-2000 [abstract], American Journal of Epidemiology 2004; 159:S86 by permission of Oxford University Press.*

*From Southern California:*  
**Differences in serum folate values at first prenatal visit by race/ethnicity, vitamin use, and body mass index, 1999-2000 [abstract].**

Lawrence JM, Watkins M, Chiu V, Erickson JD, Pettiti DB. *Am J Epidemiol* 2004 Jun 1;159(11 Suppl):S76.

**BACKGROUND:** Fortification of foods with folic acid (FA) began in 1998. The effect of fortification on folate levels in women in different demographic groups is of interest.

**METHODS:** Serum folate was quantified using the ADVIA $\ddagger$  Centaur, Immunoassay System on 12,526 women entering prenatal care at five KP medical centers from 1999-2000. Information on use of vitamins containing FA, body mass index (BMI), race/ethnicity, and age was obtained from a survey and from the infant's birth certificate. Women who used vitamins when they became pregnant and at the time of first prenatal visit were considered vitamin users; women who did not use them at either time were considered vitamin non-users.

**RESULTS:** The median folate value was 19.7 ng/mL in the study population (mean age 28 $\pm$ 6 years; range 13-45 years). The median folate value for vitamin users was 24.0 ng/mL, compared to 16.7 ng/mL for non-users.

Among vitamin non-users, Caucasian women had the highest folate values (median = 17.7 ng/mL). African-American women had the lowest values (median = 15.9 ng/mL). Values for Hispanic and Asian/Pacific Islander women were intermediate (median = 16.5 ng/mL). Among vitamin non-users, the median values decreased slightly as BMI increased (17.4 ng/mL, 16.7 ng/mL, 16.2 ng/mL for average weight, obese and very obese women respectively), but these differences are not likely to be clinically significant.

**DISCUSSION:** Other data show that food fortification with FA has had a significant impact on serum folate values nationally. This study shows that racial differences in folate status of women of childbearing age persist.

Lawrence JM, Watkins M, Chiu V, Erickson JD, Pettiti DB. *Differences in serum folate values at first prenatal visit by race/ethnicity, vitamin use, and body mass index, 1999-2000 [abstract], American Journal of Epidemiology 2004. 159, S76, by permission of Oxford University Press.*

*From the Northwest:*  
**Diagnoses and outcomes in cervical cancer screening: a population-based study.**

Insinga RP, Glass AG, Rush BB. *Am J Obstet Gynecol* 2004 Jul;191(1):105-13.

**OBJECTIVE:** This study was undertaken to examine routine cervical cancer screening diagnoses and outcomes on an age-specific basis in a US population.

**STUDY DESIGN:** We conducted an observational cohort study using 1997-2002 health plan administrative and laboratory data for women enrolled at KP Northwest (Portland, OR) in 1998.

**RESULTS:** Across all female enrollees ( $n = 150,052$ ), the annual rate of routine cervical cancer screening was 294.7 per 1000, with cytologic abnormalities detected at a rate of 14.9 per 1000. The annual incidence of cervical intraepithelial neoplasia (CIN) 1 was 1.2 per 1000 with a rate of 1.5 per 1000 for CIN 2/3. CIN 1 incidence peaked among women aged 20 to 24 years (5.1 per 1000), with CIN 2/3 rates highest among those 25 to 29 years (8.1 per 1000). From among 44,493 routine cervical smears, results were normal for 94.5%, with abnormal diagnoses of atypical squamous cells (3.3%), atypical glandular cells (0.2%), low-

grade squamous intraepithelial lesion (1.2%), high-grade squamous intraepithelial lesion (0.3%), and inconclusive/inadequate (0.5%). Of women with abnormal routine smears, CIN or cancer was detected on follow-up in 19.4% of cases, 51.5% were found to have had a false-positive smear, and 29.0% incomplete follow-up as defined by published management guidelines.

**CONCLUSION:** These are the first comprehensive age-specific estimates of routine cervical cancer screening diagnoses and outcomes to be reported within a US general health care setting. Overall, 5% of routinely screened women were found to have an abnormal cervical smear with an annual incidence of CIN across all female enrollees of 2.7 per 1000. *Reprinted from American Journal of Obstetrics and Gynecology, v191(1), Insinga RP, Glass AG, Rush BB. Diagnoses and outcomes in cervical cancer screening: a population-based study, 105-13, Copyright 2004, with permission from Elsevier.*

**CLINICAL IMPLICATION:** Approximately 1 in 20 women receiving routine cervical cancer screening will require follow-up for an abnormal Pap smear. The widespread adoption of Pap screening has been successful in reducing the incidence of cervical cancer in the US. However, this study also suggests that opportunities exist for improving the quality and efficiency of patient management, such

as by reducing the number of women with an abnormal smear who have incomplete follow-up and by decreasing Pap screening among women over the age of 65 who are at low risk for cervical cancer. —RI

*From Colorado, Georgia and Northwest:*

**Prescription drug use in pregnancy.**

*Andrade SE, Gurwitz JH, Davis RL, et al. Am J Obstet Gynecol 2004 Aug;191(2):398-407.*

**OBJECTIVE:** The purpose of this study was to provide information on the prevalence of the use of prescription drugs among pregnant women in the United States.

**STUDY DESIGN:** A retrospective study was conducted with the use of the automated databases of eight health maintenance organizations that are involved in the Health Maintenance Research Network Center for Education and Research on Therapeutics. Women who delivered of an infant in a hospital from January 1, 1996, through December 31, 2000, were identified. Prescription drug use according to therapeutic class and the United States Food and Drug Administration risk classification system was evaluated, with the assumption of a gestational duration of 270 days, with three 90-day trimesters of pregnancy, and with a 90-day period before pregnancy. Non-prescription drug use was not assessed.

**RESULTS:** During the period 1996 through 2000, 152,531 deliveries were identified that met the criteria for study. For 98,182 deliveries (64%), a drug other than a vitamin or mineral supplement was prescribed in the 270 days before delivery: 3595 women (2.4%) received a drug from category A; 76,292 women (50.0%) received a drug from category B; 57,604 women (37.8%) received a drug from category C; 7333 women (4.8%) received a drug from category D, and 6976 women (4.6%) received a drug from category X of the United States Food and Drug Administration risk classification system. Overall, 5157 women (3.4%) received a category D drug, and 1653 women (1.1%) received a category X drug after the initial prenatal care visit.

**CONCLUSION:** Our finding that almost one half of all pregnant women received prescription drugs from categories C, D, or X of the United States Food and Drug Administration risk classification system highlights the importance of the need to understand the effects of these medications on the developing fetus and on the pregnant woman. ❖

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**Using Our Talents**

We can't take any credit for our talents.  
It's how we use them that counts.

— Madeleine L'Engle, b 1918, American author

10th Annual HMO Research Network Conference

# Abstracts from the HMO Research Network

In the Fall 2004 issue, we published the first abstract from the HMO Research Network annual meeting in May 2004. In this issue we present several more. I believe publishing these abstracts creates an opportunity for Permanente physicians and clinicians to learn from the research findings in like integrated groups and health systems from other parts of the country. We will continue to share this important research in future issues.

—Tom Janisse, MD, Editor-In-Chief

May 3-5, 2004 Dearborn, MI  
*Evaluating Care Delivery*

From: HealthPartners Research Foundation

## Screening clinical breast examination sensitivity, specificity, and predictors of accuracy.

Rolnick SJ, Fenton JJ, Elmore JG on behalf of the CRN PROTECTS Group.

**BACKGROUND:** Although many US women receive regular screening clinical breast examination (CBE), the accuracy of CBE in the community setting remains uncertain.

**METHODS:** We determined the accuracy of CBE among asymptomatic female health plan enrollees in five states (WA, OR, CA, MA, and MN). Among women who received a screening CBE within one year of breast cancer diagnosis and who subsequently died of breast cancer (N = 485), sensitivity was estimated as the proportion of women whose most recent CBE was abnormal. Among women without a breast cancer diagnosis in the year following a screening CBE (N = 1427), specificity was estimated as the proportion whose screening CBE was normal. Bivariate and logistic regression analyses identified patient characteristics associated with CBE accuracy.

**RESULTS:** Among women who subsequently died of breast cancer, the sensitivity of screen-

ing CBE was 21.6% (95% CI: 18.1%, 25.6%). Decreased sensitivity was associated with: estrogen use at the time of CBE (OR 0.23; CI = 0.07-0.80) and concurrent receipt of a Pap smear (OR 0.45; CI = 0.27-0.72). There were non-significant trends toward decreased sensitivity among women with a family history of breast cancer and increasing chronic disease comorbidity. Specificity of screening CBE was 98.6% (95% CI = 97.8%, 99.0%). Both a family history of breast cancer (OR: 0.31, CI = 0.13, 0.78) and history of breast biopsy (OR 0.22, CI = 0.09, 0.55) were independently associated with decreased specificity.

**CONCLUSIONS:** Screening CBE provided in the community is less sensitive but more specific than in clinical trials of breast cancer screening.

From: The Henry Ford Health System  
**Hormone replacement therapy utilization pre- and post- women's health initiative HRT trial termination.**

Wegienka G, Havstad S.

**BACKGROUND:** In July 2002, the Women's Health Initiative Study published their conclusions that led to the early termination of the hormone replacement therapy (HRT) trial of estrogen plus progestin in postmenopausal women with an intact uterus. In *JAMA*, they reported an increased risk of breast cancer, but also a decreased risk of osteoporosis. While the findings were headline news across the nation, it is not clear whether they impacted clinical practice or the health behavior of women.

**METHODS:** Using claims data from 15,493 women ages 50-79 continuously enrolled in the Health Alliance Plan HMO from January 2001 through November 2003, we examined the counts of HRT prescriptions filled by this fixed cohort in the 18 months before and after the WHI results were published. Using the claims data, we were not able to determine whether each woman had an intact

uterus or their exact menopausal status.

**RESULTS:** Overall, the number of HRT prescriptions filled decreased over time. However, in the months immediately after July 2002, there was a steep drop in the number of HRT prescriptions filled by the fixed cohort. In January 2001, 2320 HRT scripts were filled, 1973 in June 2002, 1837 in July 2002, 1617 in August 2002, 1467 in September 2002 and 742 in November 2003. The number of new HRT users increased through the first half of 2002 and dropped continuously after peaking in June 2002. The patterns observed were similar for the most commonly filled prescription, Premarin (estrogen plus progestin/Wyeth-Ayerst), and all other HRT medications.

**CONCLUSIONS:** It appears that the publication of the WHI results and their subsequent discussion in the press affected the use of HRT in our study population. It is not clear whether the women, their clinicians, or both were the driving forces behind this reaction. However, the symptoms of menopause, such as hot flashes, sleeplessness and bone loss, can be disabling, while some women have no symptoms. Future research should study the appropriateness of HRT given the different circumstances women may encounter with menopause.

From: HealthPartners Research Foundation

## Women and hormone use in the light of new evidence.

Rolnick S, Kopher R, Kelley M.

**BACKGROUND:** Prior to the findings of the Women's Health Initiative (WHI), it was believed that hormone therapy (HT) provided numerous health benefits. With WHI, however, considerable doubt was raised regarding prior assumptions. To better understand what women who were using HT are doing and thinking in the light of recent findings, we conducted a survey. Its purpose was to assess HT usage (maintenance, discontinua-

tion or change), health behaviors, symptom control and overall concerns.

**METHODS:** Women who had a prescription for HT (PremPro or FemHTR) between 1/1/2002 and 6/30/2002 were identified through pharmacy records and stratified by duration of hormone use (recent users [ $<1$  year], women with 1-5 years of use and long-term users [ $>5$  years]). A random sample of 10% from each stratum was selected for a total of 1200 subjects. Surveys were mailed with questions on hormone use, awareness of study findings, changes in medication use or health behaviors, what influenced changes, symptoms, use of alternative medications and overall concerns.

**RESULTS:** The response rate was 70%. Of these, 69% claimed they discontinued HT. The main reasons stated for starting HT were symptom relief (70%), and bone health (46%). Many women (35%) did not consider how long they would take hormones. However of those that did, only 21% thought it would be short term. Most assumed they would continue on HT "as long as they felt okay." When asked how they learned of the new study findings, twice as many cited television and magazines than their health plan. Only 19% claimed to make no changes, others discontinued, stopped then restarted, or changed their HT. Minimal change was reported in use of alternative medications or in lifestyle.

**CONCLUSIONS:** Women appear to be heeding the warnings and taking initiative for changes regarding HT, rather than being encouraged

at the initiation of their providers. They are concerned about current symptom control and also if past usage puts them at risk for future health problems.

*From: Kaiser Permanente Southern California and Harvard Pilgrim Health Care*

### **Procedures and complications after bilateral prophylactic mastectomy.**

*West CN, Barton MB, Liu AI, Geiger AM for the Cancer Research Network PROTECTS Group; Southern California Permanente Medical Group, Pasadena, CA; Harvard Pilgrim Health Care, Boston, MA.*

**BACKGROUND:** While highly efficacious, little is known about the complications or subsequent procedures needed to rectify complications or cosmetic problems after bilateral prophylactic mastectomy. Complications and procedures occurring after bilateral prophylactic mastectomy were the focus of the study.

**METHODS:** We used automated hospitalization and cancer registry records to identify women who underwent bilateral mastectomy without breast cancer at one of six health maintenance organizations between 1979 and 1999. Confirmation of bilateral mastectomies being done for prophylactic reasons, identification of the timing of initial reconstruction and ascertaining complications and subsequent procedures were done by structured medical record review.

**RESULTS:** During the study period, 270 women

underwent bilateral prophylactic mastectomy. Median age of women at surgery was 44 years (range 23 to 74) and the majority (90%) were Caucasian. The majority of women (179, 66%) had simultaneous reconstruction but 36 (13%) had delayed reconstruction and 55 (20%) had none. After bilateral prophylactic mastectomy 466 complications occurred in 171 (63%) women, with a median of two per woman (range 1 to 13). More than half (55%) required repair, including excessive scarring and implant leakage or rupture. About a third (167, 36%) were temporary, including hematoma, hemorrhage and infection. The remaining 42 (9%) complications were permanent or psychological, including lymphedema and depression. A total of 822 subsequent procedures were performed in 167 (62%) women, with a median of four per woman (range 1 to 22) and the majority (766, 93%) were cosmetic in nature. Complications and subsequent procedures were less common in women with no reconstruction ( $\chi$  square  $p = 0.067$  and  $p \leq 0.001$ , respectively) but occurred in nearly identical proportions among women with simultaneous or delayed reconstruction ( $\chi$  square  $p = 0.764$  and  $p = 0.958$ , respectively).

**CONCLUSIONS:** Women undergoing bilateral prophylactic mastectomy may experience a range of complications and after reconstruction additional procedures may be required. The risks and the potential benefits of bilateral prophylactic mastectomy need to be weighed by women and their physicians. ❖

## **Trails and Mountains**

May your trails be crooked, winding, lonesome, dangerous, leading to the most amazing view.

May your mountains rise into and above the clouds.

— Edward Abbey, 1927-1989, naturalist and author