

Use of Hormone Replacement Therapy in Washington State

Is Prevention Being Put into Practice?

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BACKGROUND. American women are using hormone replacement therapy (HRT) for long-term disease prevention, as well as symptom control, in increasing numbers. Our study examined the role of prevention in women's decisions to initiate HRT and their intended duration of therapy.

METHODS. We analyzed the mailed survey responses of 2023 women aged 50 to 70 years from the practices of 46 physicians in the Puget Sound region for knowledge and attitudes about HRT, current use, and intended duration of therapy. Multiple logistic regression was used to model current HRT use and intended treatment length.

RESULTS. A total of 71% of our respondents were using HRT. Women with osteoporosis, coronary heart disease (CHD), or risk factors for CHD were not more likely to be using HRT, and women with CHD or risk factors for CHD were not targeted by their physicians for discussion of HRT. Of women using HRT, 77% expected lifelong use, and this was not more common among women initiating HRT for disease prevention.

CONCLUSIONS. Despite the high rates of HRT use and expected lifelong duration, use of HRT for prevention was neither higher among women most likely to benefit nor a major determinant of expected lifetime use.

KEY WORDS. Estrogen replacement therapy; attitude to health; preventive medicine. (*J Fam Pract* 1999; 48:364-371)

The use of hormone replacement therapy (HRT) by perimenopausal and postmenopausal women has become increasingly popular in the United States. Although HRT was originally used to treat perimenopausal symptoms, in recent years more emphasis has been placed on its long-term potential for preventing osteoporosis, cardiovascular disease,^{1,3} and, most recently, Alzheimer's disease.⁴ Previous concerns about the increased incidence of endometrial cancer among users of unopposed estrogen have been largely, though not completely, allayed by regimens incorporating the use of progestational agents.^{5,8} However, there is continuing concern that prolonged use of HRT may increase a woman's risk of breast cancer.^{1,9,10} The US Preventive Services Task Force² and the American College of Physicians¹¹ recommend that all women be counseled about the risks and benefits of long-term HRT, but they do not make any recommendations about its use.

Women's feelings about the use of HRT for prevention are unclear. Many women initiate HRT for symptom control, not necessarily for prevention. Some studies have found women to be significantly interested in the use of HRT for osteoporosis prevention,¹²⁻¹⁷ while other studies have found little interest in its use for prevention of

osteoporosis or little belief in its efficacy.¹⁸⁻²³ In 1993, a national survey of American women aged 45 to 60 years found that, with multiple answers allowed, 60% of women using HRT cited symptom relief as a reason for using it, 38% cited osteoporosis prevention, 34% cited prevention of cardiovascular disease, and 30% cited improvement in quality of life.²⁴ A recent study of women enrolled in a large health maintenance organization (HMO) in the state of Washington found that 47% cited menopausal symptoms as a reason for starting HRT, 32% cited osteoporosis prevention, 16% cited cardiovascular disease protection, and 30% cited having been told to use it by their physician.¹⁷ Women with cardiovascular risk factors or disease have been reported to be no more or less likely to use HRT.^{1,25-33}

We sought to evaluate the role of prevention in the initiation and continuance of HRT. We hypothesized that, given the strong belief of their physicians in the use of HRT for prevention of osteoporosis and cardiovascular disease,³⁴ women in the Puget Sound region of Washington with a diagnosis of or risk factors for osteoporosis or heart disease would be more likely to be using HRT and planning on long-term use, while more severe symptoms would lead to greater likelihood of using HRT but intentions for short- to medium-term use.

METHODS

PATIENT SAMPLING

This study was part of a larger study seeking to understand physicians' policies and practices related to HRT. A random sample of 750 obstetrician-gynecologists, family physicians, and general internists in a 2:1:1 ratio practic-

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ing in Washington, Alaska, Montana, and Idaho was obtained from the American Medical Association Masterfile. We received a 50% response rate to our mailed physician survey.³⁴ The 149 responding physicians whose practices were located in King, Pierce, and Snohomish counties of Washington were solicited for participation in the patient survey component of the study. Of those physicians, 49 (33%) agreed to provide us with lists of 75 female patients aged 50 to 70 years who had been seen in their practices in the previous few months, and 46 completed this process. The 49 consenting physicians differed significantly from the other 100 physicians on only 2 out of 111 physician survey items, both at the $P = .03$ level (without any multiple comparison correction); neither item reflected differing policies about the use of HRT. From the lists provided, 3210 surveys were sent out to patients in early 1996. Follow-up mailings were made 3 and 7 weeks after the initial mailing. We received 2085 completed surveys from eligible women, yielding a response rate of 72% for potentially eligible women. Among the exclusions were 116 women we could not locate (eg, incorrect address or no forwarding address), 138 women who were ineligible (eg, not aged 50 to 70 years), 38 women who were on the list more than once, 456 refusals, and 377 nonresponses. Also, women who reported regular periods and were not using HRT ($n = 62$) were excluded from further analysis, as they were presumably premenopausal.

This project was reviewed and approved by the University of Washington's Human Subjects Review Committee, and informed consent was obtained from survey respondents.

PATIENT DATA

Since one of the purposes of this project was to relate physicians' policies to their patients' actions, each woman was asked whether the physician from whom we obtained her name was the provider she considered responsible for her health care for women's health issues. Women who answered "no" to this question ($n = 603$) were not asked about their reasons for starting or not starting HRT, because the survey asked about this issue in relation to interactions with the physicians who provided us with their names. Women who were seeing these physicians for their women's health care needs, discussed HRT with these physicians, and decided to use or continue using HRT were asked to list the major reasons for their decisions; more than 1 answer was allowed. Choices on the survey were: (A) hot flashes, sweating, vaginal dryness, bladder problems; (B) mood swings, depression, anxiety, emotional distress; (C) hysterectomy and/or oophorectomy (removal of ovaries); (D) prevention of osteoporosis (thinning of the bones), fracture prevention; (E) prevention of heart disease; (F) to look or feel younger; and (G) other. The category "other" was followed by a blank space that women were expected to fill in.

Using the information provided, we classified a woman's menopausal status as surgical menopause with

both ovaries removed, hysterectomy with at least 1 ovary left in place, or other. Weight and height were used to compute the body mass index. All women currently using HRT were asked how long they thought they would continue to use it: (A) until my symptoms get better; (B) at most 10 years; (C) probably the rest of my life; or (D) some other length of time. A number of other questions were asked as well, but the results are not reported in this paper.³⁵

ANALYSES

The primary outcomes of interest for this study were use of HRT and anticipated duration of use for those using HRT. For the latter outcome, responses were classified as either "probably the rest of my life" or any other response. Associations were measured with chi-square tests for categorical variables; Mann-Whitney U tests for ordinal variables, such as Likert-scale responses; and t tests for continuous variables. Multiple logistic regression was used to construct multivariate models to predict the primary outcomes of interest. All variables bivariately significant at the $P < .05$ level were entered into forward and reverse stepwise regressions. Variables significant at the $P < .10$ level in the forward or reverse stepwise models were retained for evaluation in subsequent models. Because of our recruiting strategy, women were clustered within physician practices, and Stata software³⁶ was used to adjust estimates for this clustering. After this adjustment, variables still significant at the $P < .05$ level were retained in the final regression models.

RESULTS

Descriptive statistics for respondents to our survey are presented in Table 1. The mean age of respondents was 58 years. They were generally well educated, married or partnered, and financially comfortable (median household income \$35,000 to \$49,999 per year). Almost all of our respondents were insured — only 2% reported no health insurance. Seventeen percent had Medicare coverage and 1% had only Medicaid. The vast majority (93%) were non-Hispanic whites, reflecting in part the demographics of the Puget Sound region, where the population was 85% non-Hispanic whites, according to the 1990 census. Twenty-two percent of respondents had undergone a bilateral oophorectomy, an additional 20% had undergone a hysterectomy but had at least 1 ovary left in place, 37% had experienced natural menopause, 14% were having irregular menses, and 6% were having regular periods and using HRT. To assess possible biases introduced by studying women who were seeing our study physicians for their women's health care needs, we compared these women with respondents seeing other providers for this care. The latter group reported slightly lower household income ($P = .004$) and slightly larger households (mean 1.9 vs 2.0 persons, $P = .02$). When they differed on attitudinal factors, women seeing the study physicians for their women's health care needs had somewhat more positive attitudes

TABLE 1

Characteristics of Survey Respondents

Characteristic	All Respondents, %	Respondents Using HRT, %
Age, years*		
50 to 54	37.4	71.5
55 to 59	25.6	77.7
60 to 64	19.3	69.7
65 to 70	17.0	60.9
Race/ethnicity		
Non-Hispanic white	92.8	72.0
Other	7.2	62.0
Household situation†		
Married/living with partner	72.3	72.7
Other	27.7	66.6
Employment		
Full-time	39.6	74.0
Part-time	15.7	68.6
Not employed	44.7	68.8
Household income per year‡		
<\$15,000	6.9	55.6
\$15,000 to \$49,999	49.8	69.3
≥\$50,000	43.3	76.0
Surgical status*		
Bilateral oophorectomy	21.5	84.5
Hysterectomy without bilateral oophorectomy	19.5	74.2
Neither	59.1	64.7

Condition	All Respondents, %	Respondents with Condition Using HRT, %	Respondents Without Condition Using HRT, %
Osteoporosis	10.7	71.0	71.4
Heart disease§	7.3	60.6	72.1
Hypertension‡	33.1	67.8	72.6
Diabetes†	6.2	58.7	72.2
Blood clot in leg or lung	4.8	68.8	71.3

Continuous Factors	Mean for All Respondents	Mean for Women Using HRT	Mean for Women Not Using HRT
Body mass index§	26.3	26.0	27.0
Mean years of education	14.5	14.6	14.4
General health (1 = excellent, 5 = poor) ‡	2.26	2.20	2.41

HRT denotes hormone replacement therapy.

*P <.0001.

†P <.05.

‡P <.001.

§P <.01.

toward HRT. To assess possible biases from our sampling technique, we compared HRT use rates for respondents enrolled in an HMO with published results from a study conducted there in 1995.¹⁷ That study found 42.5% of study subjects were using HRT; our respondents from the same HMO had a 64% usage rate in 1996.

Women's knowledge and beliefs about the benefits and risks of HRT varied: approximately two thirds believed it decreased the risk of osteoporosis, approximately one half believed it decreased the risk of heart disease, approximately one half believed it had little effect on the risk of breast cancer, and approximately one fourth believed it significantly increased the risk of breast cancer. Approximately 20% reported they had no idea of its effects on heart disease and osteoporosis.

A total of 71% of the respondents were using HRT. Women who had a bilateral oophorectomy were most likely to be using HRT (84%); women who had a hysterectomy but not a bilateral oophorectomy were less likely to use it (74%); and women retaining a uterus and at least 1 ovary were least likely (65%) to be using it. Of women using HRT who had not undergone a hysterectomy, 6.8% were on regimens that did not include any progestin, while 6.1% of women who had undergone a hysterectomy were on regimens that included progestin. Among all women using HRT, 24% were on regimens that included a regular amount of time without taking any hormones. Ninety-four percent of women using HRT were doing so orally; 6% were using transdermal patches. Women using HRT who saw the study physicians for their women's health care issues reported having initiated HRT for a variety of reasons: 63% cited physical symptoms, such as hot flashes and vaginal dryness; 30% cited emotional symptoms, such as mood swings and depression; 9% cited "to look or feel younger"; 28% cited having had a hysterectomy or oophorectomy (with 45% of women who had had only a hysterectomy doing so); 56% cited osteoporosis prevention; 36% cited cardiovascular disease prevention; and 11% checked the "other" response and wrote in a reason. Of these other reasons, the most common were to control bleeding (4.1%), because their physician had recommend-

ed it (2.2%), and to treat sleep disturbances (1.5%). Many of these women listed multiple classes of reasons for starting HRT, but some did report only 1 reason for using HRT; 13% cited only prevention, 24% gave as their reasons only symptoms or lifestyle, and 8% reported only having a hys-

TABLE 2

Association of Health Conditions with Physician-Patient Discussion of Hormone Replacement Therapy

Condition	N	Any Discussion of HRT with Physician			Physician-Initiated Discussion of HRT		
		%	OR*	95% CI	%	OR*	95% CI
Osteoporosis							
Yes	138	86	1.24	0.75, 2.04	58†	1.52	1.04, 2.20
No	1199	87	1		48	1	
Heart disease							
Yes	108	80	0.69	0.39, 1.21	47	0.92	0.65, 1.30
No	1230	87	1		50	1	
Hypertension							
Yes	460	83†	0.78	0.58, 1.07	47	0.87	0.72, 1.06
No	883	88	1		50	1	
Diabetes							
Yes	80	70†	0.37	0.21, 0.66	48	0.93	0.54, 1.60
No	1260	88	1		49	1	

HRT denotes hormone replacement therapy; OR, odds ratio; CI, confidence interval.

*Odds ratios are adjusted for age and hysterectomy/oophorectomy status.

† $P < .05$.

terectomy or oophorectomy. Women using HRT rated their health status as somewhat better than women not using it, but health status did not vary by reason for deciding whether to start HRT.

Before adjustment for demographic factors and self-reported health status, women reporting a diagnosis of osteoporosis appeared no more likely to be using HRT than women without this diagnosis (Table 1). Women who reported having had a heart attack or a diagnosis of heart disease, hypertension, or diabetes appeared less likely than other women to be using HRT. However, none of these differences remained significant after adjustment. Women with a personal history of breast cancer were much less likely to be using HRT (16 of 89). Women with a history of breast cancer who were using HRT were less likely to believe that HRT could cause cancer than those not using HRT (31% vs 75%; $P = .001$), although both groups ascribed similar importance to the possibility that HRT could cause cancer. The likelihood of using HRT among women with a history of a blood clot in the leg or lung and those with more than 2 migraine headaches per month was similar to that of women without such histories.

Women stating that they primarily obtained care for women's health conditions from our study physicians were asked whether they had ever discussed HRT with this physician. As shown in Table 2, women reporting a diagnosis of osteoporosis or heart disease were no more likely than other women to have discussed HRT with their physician, and women with hypertension and diabetes

were less likely to have done so, with the latter difference remaining significant after adjusting for age and hysterectomy or oophorectomy status. Women with osteoporosis were significantly more likely to report that their physician had initiated a conversation about HRT, although this was not the case for other conditions.

As expected, women reporting worse menopause-related symptoms were more likely to be using HRT. The strongest association was with severity of hot flashes ($P < .001$ by Mann-Whitney U test), followed by irritability or mood swings ($P < .001$), bladder problems (leaking urine) and troubled sleep (both $P < .001$), and vaginal dryness ($P = .003$).

Table 3 shows factors significantly associated with HRT use in a multiple logistic regression model. Income of more than \$15,000 per year was strongly associated with greater odds of using HRT, as was having had a bilateral oophorectomy and having received a recommendation from one's health care provider to use HRT. Other significant factors included the importance a woman attached to HRT in being able to prevent disease, stronger agreement that she had enough information to make a decision, and a stronger belief that menopausal symptoms should be treated with hormones rather than with natural approaches. In this model, hysterectomy without a bilateral oophorectomy was not associated with greater odds of using HRT, while a history of breast cancer and agreeing more strongly that HRT could cause side effects were associated with lower odds of using HRT.

Seventy-seven percent of women using HRT indicated

that they expected to use it for the rest of their lives. Only 1.8% expected to use it "only until my symptoms get better" and 4.6% for "at most 10 years." The remaining 17% predominantly indicated that they either did not know how long they would use it or that they would decide in association with their physicians. Reporting a hysterectomy or oophorectomy as a reason for starting HRT was strongly associated with expecting to use HRT indefinitely (87% vs 71%; $P < .0001$). Somewhat fewer women citing physical symptoms as a reason for starting HRT expected to use it indefinitely (74% vs 80%; $P = .03$). Other reasons for starting the therapy (eg, emotional symptoms, osteoporosis prevention, heart disease prevention, or to look or feel younger) were not significantly associated with expecting to use HRT indefinitely.

To further evaluate the roles of attitudes, health status, and other factors in intended lifelong HRT use, compared with the intention to use it for any other duration, we constructed a logistic model. Taking estrogen on any schedule other than daily was associated with approximately one half to two thirds the odds of expected lifelong usage (Table 4). Taking progesterone with estrogen also decreased these odds by approximately half; this factor was nearly collinear with not having had a hysterectomy, was slightly more significant, and hence is the one remaining in the model. Having a diagnosis of osteoporosis approximately doubled a woman's odds of intending lifelong usage. Women who reported taking vitamins were more likely to expect this treatment duration, and women who reported limiting their alcohol intake to improve their health or prevent disease were less likely to expect it. The woman's belief that menopause is more of an endocrine deficiency state than a natural process, more strongly favoring the use of hormones than natural approaches, viewing her health care provider's opinion about HRT as more important, believing she had enough information to decide, and feeling certain that her decision was right were all associated with greater odds of expecting lifelong use of HRT.

DISCUSSION

The most striking findings of our study are (1) the large proportion of women who were using HRT; (2) the lack of association between having a diagnosis of a condition like

ly to be helped by HRT and its actual use; and (3) the lack of association between initiating HRT for prevention and intending to take it indefinitely. The first of these findings is likely explained by our study population and our practice/utilization-based sampling strategy. Our subjects lived in the western United States, were selected because of their recent visit for medical care, and were mostly white, well-educated, and reasonably well-off. Other studies have found higher rates of HRT use in the western states than elsewhere.^{27,28} A recent study of postmenopausal black women, a population found in other studies to have substantially lower HRT rates,^{27,28} found that 42% were using HRT.²⁸ Our comparison of use by respondents enrolled in an HMO in 1996 and results from a 1995 survey in that HMO¹⁷ suggests that we may have overestimated actual usage rates by as much as 50%.

TABLE 3

Logistic Regression Model Predicting Current Use of HRT

Factor	OR	95% CI
Diagnosis of breast cancer	0.04	0.02, 0.11
Household income, year		
<\$15,000	1	
\$15,000-\$49,999	2.55	1.43, 4.56
≥\$50,000	3.04	1.61, 5.76
Menopausal status		
Peri- or postmenopausal, no surgery	1	
Hysterectomy only	0.98	0.67, 1.44
Bilateral oophorectomy	2.25	1.51, 3.36
Agree that "HRT could cause side effects, eg, bleeding, bloating"	0.75	0.68, 0.83
Importance that "HRT could prevent disease, eg, osteoporosis, heart disease"†	1.41	1.30, 1.54
Severity of hot flashes‡	1.09	1.01, 1.17
Severity of irritability/mood swings‡	1.09	1.01, 1.18
Treat menopause naturally vs with hormones§	1.34	1.20, 1.51
Have enough information to decidell	1.35	1.23, 1.48
Preferred physician's role in decision¶	1.13	1.04, 1.22
Recommendation of health care providers#	1.94	1.61, 2.32
Body mass index	0.97	0.95, 1.00

HRT denotes hormone replacement therapy; OR, odds ratio; CI, confidence interval.

*On a scale where 1 = strongly disagree, 7 = strongly agree.

†1 = not at all important, 7 = extremely important.

‡0 = never, 1 = mild, 7 = severe.

§ 1 = "Distressing menopausal symptoms should be treated with natural approaches such as nutrition, vitamins, and exercise," 7 = "Distressing menopausal symptoms should be treated with hormones."

ll 1 = strongly disagree with statement "I have enough information about HRT to make a decision," 7 = strongly agree with same statement.

¶ 1 = "My physician's role is to provide information and let me make my own decision about using HRT," 7 = "My physician's role is to evaluate my situation and make the best decision for me about using HRT."

TABLE 4

Logistic Regression Model Predicting Indefinite Use of Hormone Replacement Therapy Compared with Any Other Duration

Patient Factor	OR	95% CI
Number of days per month takes estrogen		
Every day	1	
About 25 days per month	0.67	0.46, 0.97
Other	0.49	0.28, 0.87
Takes progestin with estrogen	0.44	0.32, 0.59
Diagnosis of osteoporosis	2.01	1.01, 4.02
Takes vitamins	1.40	1.06, 1.87
Limits alcohol intake	0.65	0.47, 0.90
Menopause natural vs due to disease*	1.19	1.06, 1.34
Treats menopause naturally vs with hormones†	1.16	1.03, 1.30
Has enough information to decide‡	1.18	1.08, 1.30
Importance of health care provider recommendation about HRT§	1.24	1.08, 1.42
Certainty that decision is right	1.17	1.06, 1.29

HRT denotes hormone replacement therapy; OR, odds ratio; CI, confidence interval.
 *On a scale where 1 = "I do not view menopause as a disease. If my body naturally stops producing estrogen, I do no harm by allowing this to happen," 7 = "Because menopause is brought on by lower estrogen levels, it should be viewed as a medical condition. It should be treated like any other hormone deficiency."
 †1 = "Distressing menopausal symptoms should be treated with natural approaches," 7 = "Distressing menopausal symptoms should be treated with hormones."
 ‡1 = strongly disagree with statement "I have enough information about HRT to make a decision," 7 = strongly agree with same statement.
 §1 = very unimportant, 5 = very important.
 ||1 = very uncertain, 7 = very certain.

Stafford and colleagues²⁸ found that women with osteoporosis were more likely to be using HRT. Our respondents with osteoporosis were more likely to have their physicians initiate a discussion of HRT use, but they were not more likely overall to have discussed the therapy or to be using it.

The finding that women with cardiovascular disease or risk factors are no more likely to be using HRT has been observed by other researchers as well.^{1,25-33} Our study was done before the publication of the Heart and Estrogen/Progestin Replacement Study (HERS) findings cast serious doubt on the putative cardioprotective effects of HRT, at least for women with established cardiovascular disease,³⁷ and both the women we surveyed and their providers³⁴ generally expressed strong belief in the cardioprotective benefits of HRT. Nonetheless, as in previous studies and despite the very high usage rate of HRT, we did not find women with or at increased risk for

cardiovascular disease either to be more likely to use HRT or to have been specifically targeted by their physicians for discussion of HRT.

The seeming disconnection between likely benefit and taking HRT is also evident in the data about expected duration of therapy. We expected that women starting HRT for disease prevention would be more likely to expect indefinite use than other women, but the results do not show this to be true. Women starting HRT for physical symptoms, such as hot flashes, were modestly less likely to expect indefinite usage, but other reasons for initiation were not associated with expected duration of therapy. Women with osteoporosis who were taking HRT were more likely to expect lifelong use. Unfortunately, we did not ask women why they expected to continue HRT for the duration they indicated. If women, after starting HRT for any reason, became convinced of its long-term preventive benefits, we would expect our cross-sectional study of current attitudes to find little difference between women with differing reasons for initiation. But many highly significant differences were found (data not shown). One suggestion for this may lie in the answers given by those intending other than lifelong use. Most of these answers indicated either that they did not know how long they would take it or that they would decide in association with their physicians. The expectation of indefinite usage is markedly at odds with findings

from studies suggesting substantial discontinuation rates,^{17,26,27,29,30,32,38-40} whether these behavioral intentions will translate into long-term use is not known.

A substantial number of women were following HRT regimens that are viewed as suboptimal—one fourth had hormone-free periods, some women were receiving unopposed estrogen despite having an intact uterus, and some women without a uterus were receiving progestins.³ These estimates were quite close to those produced by the larger group of physicians from which the physicians whose patients were surveyed for this study were recruited.³⁴ This suggests that some physicians may need education about preferred HRT regimens or help in getting their patients to change to better regimens. Also, 45% of the women who had had a hysterectomy but not oophorectomy felt that this was a reason for using HRT.

The logistic model for current use of HRT emphasizes the importance of several factors in women's

decisions, particularly oophorectomy, income, health care provider recommendations, and attitudes about HRT. Other studies have also found that having had a bilateral oophorectomy is strongly associated with using HRT.^{15,17,24,26,27,29,30,41} The model for intended duration of use emphasizes the importance of osteoporosis prevention for women, along with the type of regimen followed (daily estrogen rather than interrupted therapy). The highly significant negative association of intended lifelong duration with progestin use could reflect either greater willingness to use HRT when there is no possibility of uterine bleeding or other issues associated with progestin use.

LIMITATIONS

The major weakness of our study is the nonrandom nature of the sample of women surveyed. Women were selected for having recently visited physicians who had responded to our physician survey, overrepresenting frequent users of medical care and those who see physicians who may be stronger advocates of HRT than the general physician population. The women were well-off and well educated, limiting generalizability to less advantaged populations. The West Coast often leads trends, so our findings may reflect where the rest of the country is heading—though this could be changed by new findings, such as those from HERS. Although users of HRT might have been more likely to respond to our survey than nonusers, a 72% response rate makes it appear unlikely that our major conclusions would have been significantly changed if all surveyed women had responded.

CONCLUSIONS

We present several findings of note. A remarkably high percentage of the women we surveyed were using HRT, and more than three fourths of them expected to take it for the rest of their lives. A significant number were using sub-optimal regimens. Starting HRT solely or partially for preventive considerations did not increase the odds of expecting to remain on the therapy indefinitely. Most notably, women with risk factors for osteoporosis, heart disease, and coronary heart disease were no more likely to be using HRT than other women, and women with heart disease or its risk factors were not being targeted by their physicians for discussions of HRT. While our findings require replication in other populations, they suggest the need for the development of systems that facilitate targeting discussions for those women most likely to benefit from HRT and that ensure the use of optimal regimens among women who use HRT.

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REFERENCES

1. Barrett-Connor E, Grady D. Hormone replacement therapy, heart disease, and other considerations. *Ann Rev Public Health* 1998; 19:55-72.
2. US Preventive Services Task Force. Guide to clinical preventive services. Baltimore, Md: Williams & Wilkins, 1996:829-43.
3. Grady D, Rubin SM, Petitti DB, et al. Hormone therapy to prevent disease and prolong life in postmenopausal women. *Ann Intern Med* 1992; 117:1016-37.
4. Yaffe K, Sawaya G, Lieberburg I, Grady D. Estrogen therapy in postmenopausal women: effects on cognitive function and dementia. *JAMA* 1998; 279:688-95.
5. Beresford SA, Weiss NS, Voigt LF, McKnight B. Risk of endometrial cancer in relation to use of oestrogen combined with cyclic progestagen therapy in postmenopausal women. *Lancet* 1997; 349:458-61.
6. Pike MC, Peters RK, Cozen W, et al. Estrogen-progestin replacement therapy and endometrial cancer. *J Natl Cancer Inst* 1997; 89:1110-6.
7. The Writing Group for the PEPI Trial. Effects of hormone replacement therapy on endometrial histology in postmenopausal women: the Postmenopausal Estrogen/Progestin Interventions (PEPI) Trial. *JAMA* 1996; 275:370-5.
8. Grady D, Ernster VL. Hormone replacement therapy and endometrial cancer: are current regimens safe? *J Natl Cancer Inst* 1997; 89:1088-9.
9. Kuller LH, Cauley JA, Lucas L, Cummings S, Browner WS. Sex steroid hormones, bone mineral density, and risk of breast cancer. *Environ Health Perspect* 1997; 3:593-9.
10. Colditz GA. Relationship between estrogen levels, use of hormone replacement therapy, and breast cancer. *J Natl Cancer Inst* 1998; 90:814-23.
11. American College of Physicians. Guidelines for counseling postmenopausal women about preventive hormone therapy. *Ann Intern Med* 1992; 117:1038-41.
12. Ringa V, Ledesert B, Breart G. Determinants of hormone replacement therapy among postmenopausal women enrolled in the French GAZEL cohort. *Osteoporos Int* 1994; 4:16-20.
13. Ferguson KJ, Hoegh C, Johnson S. Estrogen replacement therapy: a survey of women's knowledge and attitudes. *Arch Intern Med* 1989; 149:133-6.
14. Draper J, Roland M. Perimenopausal women's views on taking hormone replacement therapy to prevent osteoporosis. *BMJ* 1990; 300:786-8.
15. Cauley JA, Cummings SR, Black DM, Mascioli SR, Seeley DG. Prevalence and determinants of estrogen replacement therapy in elderly women. *Am J Obstet Gynecol* 1990; 163:1438-44.
16. Swiers D. Women's knowledge of HRT and the prevention of osteoporosis. *Nurs Stand* 1996; 10:35-7.
17. Newton KM, LaCroix AZ, Leveille SG, Rutter C, Keenan NL, Anderson LA. Women's beliefs and decisions about hormone replacement therapy. *J Women's Health* 1997; 6:459-65.
18. Egeland GM, Matthews KA, Kuller LH, Kelsey SF. Characteristics of noncontraceptive hormone users. *Prev Med* 1988; 17:403-11.
19. Koster A. Hormone replacement therapy: use patterns in 51-year-old Danish women. *Maturitas* 1990; 12:345-56.
20. Logothetis ML. Women's decisions about estrogen replacement therapy. *West J Nurs Res* 1991; 13:458-74.
21. Roberts PJ. The menopause and hormone replacement therapy: views of women in general practice receiving hormone replacement therapy. *Br J Gen Pract* 1991; 41:421-4.
22. Griffiths F. Women's health concerns. Is the promotion of hormone replacement therapy for prevention important to women? *Fam Pract* 1995; 12:54-9.

23. Seto TB, Taira DA, Davis RB, Safran C, Phillips RS. Effect of physician gender on the prescription of estrogen replacement therapy. *J Gen Intern Med* 1996; 11:197-203.
24. Utian WH, Schiff I. NAMS/Gallup survey on women's knowledge, information sources, and attitudes to menopause and hormone replacement therapy. *Menopause* 1994; 1:39-48.
25. Barrett-Connor E, Wingard DL, Criqui MH. Postmenopausal estrogen use and heart disease risk factors in the 1980s. Rancho Bernardo, Calif, revisited. *JAMA* 1989; 261:2095-100.
26. Rosenberg L, Palmer JR, Rao RS, Adams-Campbell LL. Correlates of postmenopausal female hormone use among black women in the United States. *Obstet Gynecol* 1998; 91:454-8.
27. Brett KM, Madans JH. Use of postmenopausal hormone replacement therapy: estimates from a nationally representative cohort study. *Am J Epidemiol* 1997; 145:536-45.
28. Stafford RS, Saglam D, Causino N, Blumenthal D. Low rates of hormone replacement in visits to United States primary care physicians. *Am J Obstet Gynecol* 1997; 177:381-7.
29. Scalley EK, Henrich JB. An overview of estrogen replacement therapy in postmenopausal women. *J Women's Health* 1993; 2:289-94.
30. Johannes CB, Crawford SL, Posner JG, McKinlay SM. Longitudinal patterns and correlates of hormone replacement therapy use in middle-aged women. *Am J Epidemiol* 1994; 140:439-52.
31. Derby CA, Hume AL, Barbour MM, McPhillips JB, Lasater TM, Carleton RA. Correlates of postmenopausal estrogen use and trends through the 1980s in two southeastern New England communities. *Am J Epidemiol* 1993; 137:1125-35.
32. Barrett-Connor E. Postmenopausal estrogen and prevention bias. *Ann Intern Med* 1991; 115:455-6.
33. Matthews KA, Kuller LH, Wing RR, Meilahn EN, Plantinga P. Prior to use of estrogen replacement therapy, are users healthier than nonusers? *Am J Epidemiol* 1996; 143:971-8.
34. Saver BG, Taylor TR, Woods NF, Stevens NG. Physician policies on the use of preventive hormone therapy. *Am J Prev Med* 1997; 13:358-65.
35. Woods NF, Saver B, Taylor T. Attitudes toward menopause and hormone therapy among women with access to health care. *Menopause* 1998; 5:178-88.
36. Stata Corporation. *Intercooled Stata 5.0 for Windows 95*. College Station, Tex: Stata Corporation, 1996.
37. Hulley S, Grady D, Bush T, et al. Randomized trial of estrogen plus progestin for secondary prevention of coronary heart disease in postmenopausal women. Heart and Estrogen/progestin Replacement Study (HERS) Research Group. *JAMA* 1998; 280:605-13.
38. Ryan PJ, Harrison R, Blake GM, Fogelman I. Compliance with hormone replacement therapy (HRT) after screening for post menopausal osteoporosis. *Br J Obstet Gynaecol* 1992; 99:325-8.
39. Salamone LM, Pressman AR, Seeley DG, Cauley JA. Estrogen replacement therapy: a survey of older women's attitudes. *Arch Intern Med* 1996; 156:1293-7.
40. Ravnkar VA. Compliance with hormone therapy. *Am J Obstet Gynecol* 1987; 156:1332-4.
41. Ringa V, Ledesert B, Gueguen R, Schiele F, Breart G. Determinants of hormonal replacement therapy in recently postmenopausal women. *Eur J Obstet Gynecol Reprod Biol* 1992; 45:193-200.