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Provider attributes associated with hormone therapy prescribing frequency

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Abstract

Objective—To identify provider characteristics associated with hormone therapy prescribing.

Design—Cross-sectional. In December 2005 we mailed surveys to providers practicing in two integrated health care delivery systems located in North Western and North Eastern United States; 379 responded (74%) and 249 (49% of total) granted access to their automated data. Data included provider demographics, practice characteristics, and perceptions about hormone therapy. Provider-specific annual hormone therapy prescribing frequency was calculated as: days supply of hormone therapy filled divided by the number of visits (among women age 45-80). Factors associated with higher rates of hormone therapy prescribing were identified using bivariate and multivariate analyses.

Results—We report results separately for primary care providers (internists and family practitioners) and obstetrician/gynecologists since significant correlates differed in these two groups. For both primary care providers and obstetrician/gynecologists, in multivariate analyses, hormone therapy prescribing varied by site ($P \leq 0.002$) and years at the health care organization ($P \leq 0.01$). For primary care providers only, higher hormone therapy prescribing was associated with reported expert knowledge of the hormone therapy trials (P=<0.001). For obstetrician/gynecologists, higher hormone therapy prescription was related to feeling well prepared to counsel women on hormone therapy (P=<0.007), believing that the risks of estrogen with progestogen had been exaggerated (P=0.04), and seeing younger aged patients (p=.03).

Conclusion—After the release of the WHI findings and practicing under similar clinical guidelines, hormone therapy prescribing is associated with providers' confidence, practice location, and time with a healthcare organization.

Keywords

Hormone therapy; Prescriptions; Physician's Practice; Menopause

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Introduction

An estimated 25 million US women will undergo menopause in the next decade.[1] Of the 70% of women who will experience hot flashes[2] an estimated 64% will have symptoms for 1-5 years and 26% for 6-10 years.[3] Hormone therapy (HT) is the most effective treatment for menopause related vasomotor symptoms.[4] However, with the release of the Women's Health Initiative (WHI) trial results[5,6,7] preventive use for cardiovascular disease and dementia is not recommended.

Since the release of the WHI findings, providers appear to be more conservative in their prescribing of HT. HT use has plummeted[8], and spending for promotional activities by pharmaceutical industry has declined.[9] Never-the-less, a recent survey of American College of Obstetrics and Gynecology fellows reports that 49% of respondents did not find the WHI results convincing.[10] Providers are the integral connection between research and its translation to clinical practice and their advice is an important factor in women's decision to use HT.[11, 12,13,14,15] In this complex arena of clinical practice physicians' knowledge, views, education, and experience may influence their decision to prescribe HT.

Since the release of the WHI findings, there have been studies reporting prescribing practices in the US and factors associated with these practices.[16,17,18] However, to our knowledge, no studies include both self-reported provider information and an objective measure of HT prescribing. In this study we assess the associations between an objective measure of HT prescribing frequency constructed from automated pharmacy and clinic visit data and provider characteristics including: 1) demographics; 2) practice type; 3) scientific knowledge and views; 4) perception of patient views regarding HT use; and 5) self-rated HT prescribing practice.

Methods

Setting

The study was conducted at two locations: 1) a northwest site (NW, Group Health), an integrated health care system in Washington State with over 550,000 enrollees, including greater than 110,000 women aged 45-80 years; and 2) a northeast site (NE, Harvard-Vanguard Medical Associates), a multi-site, multi-specialty medical practice in the Greater Boston area, with more than 300,000 members.

Both locations released post-WHI guidelines, consistent with the American College of Obstetricians and Gynecologists recommendations.[19] At both locations, the vast majority of patients are insured by plans with drug benefits. Both sites use a pharmaceutical formulary. A self-administered survey, along with a $25 incentive, was mailed between December 2005 and March 2006, to all family practice physicians, internists, obstetrician/gynecologists (OB/GYNs), nurse practitioners, physician's assistants, and nurse midwives. Eligibility criteria included: 1) currently working at the health care organization; 2) worked at the health care organization for at least 12 months; 3) 50 or more visits by women aged 45-80 years in the prior year; and 4) provided HT counseling and/or prescribed HT in the prior year. Providers who did not respond within 2 weeks received 2 successive reminder postcards, and a third reminder with another copy of the survey. The Institutional Review Boards at both sites approved the study.

Main outcome measure

HT prescribing frequency—Our objective measure of HT prescribing frequency was calculated for providers who gave permission to view electronic pharmacy data. Using data for the 12 month period prior to the survey, we determined the total days supply of estrogen fills for women age 45-80 written by a particular provider. Ideally, our denominator would

include the number of women reporting hot flashes seen by the provider during the year, but this information was not available. So instead, we used a definition similar to what has been used in previous work.[20] We divided the annual days supply of estrogen written by a provider by the total number of visits made to the provider during the year by women 45-80, the age when women are most likely to have vasomotor symptoms. At the NW site, this information was available for providers who worked at the staff model facilities. At the NE site, this information was available for the patients insured by Harvard Pilgrim Health Care, a health maintenance organization, which provided the researcher team with utilization data. NE providers also saw other patients who were insured by other health care plans. Therefore, both the average number of visits per provider as well the average number of HT fills per provider was lower at the NE site as compared to the NW site (486 vs. 802 visits and 23 vs. 122 fills respectively). Day's supply of HT was not directly available at the NE site. We created linear regression models based on NW information to convert NE data (drug name, form, strength, and quantity) to days supply.

Main Exposure measures

Provider characteristics—We obtained information on provider characteristics including age and gender, and type of practice (physicians, nurse practitioners, nurse midwives, nursing other, physician's assistants). For analysis, field of practice was categorized as OB/GYN or primary care (PCP) (family practice or internal medicine).

To assess providers' perceptions of their patients' views regarding HT, they were asked to rate how relevant the WHI results are for perimenopausal women in their practice (irrelevant (1) to highly relevant (7)) and how much they agree (strongly agree (1) to strongly disagree (5)) with the concepts that: 1) "most women who are on HT want to come off"; 2) "most women who wish to come off HT will do so on their own without my recommendations"; 3) "most women who experience hot flashes want to try methods other than HT for symptom relief"; 4) "women want HT because they think it makes them feel younger"; and 5) "women want HT because it helps with other symptoms such as libido, sleep, mood, or energy".

Providers were asked "how prepared do you feel to counsel a woman about HT" (not at all (1) to very well (4)), and to describe their knowledge about the Heart and Estrogen/progestin Replacement Study (HERS) and WHI trials (limited (1) to expert level (7)).

Providers' views regarding the WHI findings were assessed by asking them if "the risks of estrogen with progestogen have been" exaggerated (1) to appropriately described (7). They also rated their agreement (strongly agree (1) to strongly disagree (5)) that a convincing scientific case has been made for each of the risks and benefits of HT use including increased risk of breast cancer and stroke, the addition of progestogen to estrogen to prevent endometrial cancer, HT for the prevention of colon cancer, Alzheimer's disease, osteoporosis, and coronary heart disease in women with or without diabetes.

Providers were also asked: to categorize their rate of prescribing HT for menopausal women as compared with colleagues nation-wide (very high (1) to very low (5)); if as a result of the WHI results they are less likely to recommend HT for menopause symptoms (strongly agree (1) to strongly disagree (5)); and to rate their emphasis on discontinuation of HT(encourage all women to discontinue as soon as possible (1) to let women using HT to continue as long as they want to (5)).

Other covariates that could influence HT prescribing: To control for overall health of the women seen by a provider we used the RxRisk score, a measure of health status based on an individual's age, sex, insurance status, and chronic condition profile measured by outpatient pharmacy dispenses.[21] This measure was only available for NW women and was averaged

across all visits made by women aged 45 to 80, seen by the provider during the year prior to the survey.

We also computed the average age of women included in the denominator of a given provider's prescribing measure.

Analysis: We compared the characteristics of providers who did and did not provide permission to use automated data using Pearson's chi square or Fisher's exact tests for percents and F-tests for means.

Associations between provider factors and prescribing frequency were first accessed in bivariate analyses using t-tests for factors with 2 levels or one-way analysis-of-variance models for factors with 3 or more levels. For ordinal categorical variables, we used a linear regression model F-statistic to test for trend. To determine which factors were most strongly associated with HT prescribing we performed multivariable linear regression analysis that included provider factors that were associated with HT prescribing at an $\alpha \leq 0.1$ significance level in the bivariate analysis. We fit the usual least-squares regression models to get the standard least-squares p-value and confidence intervals. We also computed empirical (sandwich) standard errors and p-values to account for any non-normality and heteroskedasticity (non-constant variances) in our outcome of HT prescribing frequency. Since the least-squares and empirical standard errors and p-values were similar, we present only the former. Due to the high correlation between years at the health care organization, provider age (correlation coefficient 0.68), and years practicing medicine (correlation coefficient 0.71), only one of these variables, years at the health care organization, was retained in the multivariable model. A Wald test was used to test interaction terms for site (NE or NW) and field of practice. Using a Bonferroni correction (.05/number of interactions tested) an interaction was considered significant at an $\alpha \leq 0.003$.[22] Since a number of significant interactions with field of practice were identified, separate multivariable models were performed for PCP and OB/GYN.

Results

Of the 509 eligible providers, 379 providers (74%) completed the survey and of these 249 (66%, 49% of total) consented to use of their automated prescription and visit data (NW n=177; NE n=72). The majority of respondents were physicians practicing at a health care organization for 10 or more years (Table 1). Fifty-seven percent were female, of these 50% were pre-menopausal, and 32% of the perimenopausal or postmenopausal providers were using HT. Most PCPs at the NE site practiced in the field of internal medicine; most at the NW site were in family practice. There were no differences in gender (female in consenters-57%; non-consenters 53%), field of practice (OB/GYN in consenters 18%; non- consenters 16%), full or part-time FTE (part-time FTE in consenters 53%; non-consenters 50%), age (mean age of consenters 49 years; non-consenters 50 years), or years practicing medicine (mean years in consented 20; non-consenters 19 years) between providers who did and did not give permission to access their automated data. Compared to colleagues nationwide, 78% of providers who self-rated their HT prescribing practices as high consented to use of their automated data versus 56% of those who self-rated their HT prescribing practices as low.

Over 50% of the providers felt they had expert knowledge regarding the HERS and WHI trials; and 77% thought that the findings of the WHI trial were relevant to the women in their practice. There was excellent agreement between the objective measure of HT prescribing frequency based on automated data and the providers' self-described prescribing practices (Table 2). Also, as expected, lower prescribing frequency was observed in providers who's average female patient was greater than 56 years of age (8.2 vs. 18.0, $P<0.001$) and whose patients had a higher degree of co-morbidity (Rx Risk: 9.3 upper tertile vs. 13.0 lower tertile; P=0.02) (Table 3).

HT prescribing frequency was greater for OB/GYN's than PCP and in the NW compared to the NE (NW PCP 9.4, NW OB/GYN's 24.8: NE PCP 2.0, NE OB/GYN's 8.5; P <.001). Other provider characteristics associated with higher HT prescribing in bivariate analysis included more years at the health care organization (P=0.001), older provider age (P=0.04), and a female provider using (P=0.001) or likely to use HT herself (P=0.02) (Table 3).

Providers' perceptions about patient preferences regarding HT use were also associated with HT prescribing in bivariate analysis. Mean HT prescribing frequency was lower among providers who thought that the WHI findings were relevant to perimenopausal women in their practice (9.0 vs. 12.5 irrelevant to neutral; P=0.03) and agreed that most women on HT want to come off (8.4 vs. disagree 12.8; P=0.001)

On a population level, providers' perception about the strength of the scientific case for the preventive benefits and risks of HT use was not associated with HT prescribing frequency. However, HT prescribing frequency was higher for providers who felt that the risk of estrogen with progestogen had been exaggerated (14.5) compared to those who thought the risk had been appropriately described (8.3; P<0.001). Providers' confidence in their knowledge also appeared important. Mean HT prescribing frequency was higher among providers who felt very well prepared to counsel women about HT (14.9 vs. 8.7 somewhat or adequately prepared; P=<0.001) and reported expert knowledge of the recent trials (12.0 vs. 6.4 limited or average; P=<0.001).

In multivariate linear regression that included variables associated with HT prescribing in bivariate analysis, the variables that were associated with HT prescribing were dependent on a provider's field of practice, so we ran these analyses separately for PC and OB/GYN providers. A statistically significant association remained, for both PCPs and OB/GYNs, between increased HT prescribing and practicing at the NW site and increased years at the health care organization (Table 4). Other characteristic associated with HT prescribing frequency varied depending on field of practice. PCPs who reported expert knowledge of the HERS and WHI trials, on average, prescribed 1 more day of HT per visit (P < 0.001) than providers with more limited knowledge. For OB/GYNs, feeling very well prepared to counsel women on HT use was associated with an average 10 day increase in HT prescribing per visit compared to providers who felt adequately or not at all prepared (P=0.01). In addition, lower HT prescribing was associated with increasing age of their patient population (1.7 day less/visit for each increase in year of average patient age; P=0.03) and with a providers perception that the risks of estrogen with progestogen had been appropriately described in the WHI studies (2 days less/visit; P=0.04) compared to providers who believed it had been exaggerated.

Discussion

This survey was conducted after early discontinuation and publication of the WHI estrogen[7] and estrogen plus progestin[5] trials and the WHI Memory Study.[23,6] Surveyed providers practiced at health care organizations that provided guidelines consistent with prescribing HT for the relief or vasomotor symptoms at the lowest dose, for the shortest period, given a favorable risk-befit analysis but not for prevention.

We observed lower HT prescribing frequency in the NE compared to the NW. This is consistent with findings reported by Hing and Brett. Using data from the 2001-2003 National Ambulatory and National Hospital Ambulatory Medical Care Surveys they reported a lower percentage of visits by women 40 or older living in the NE had HT referenced, as compared to other regions in the U.S. Others have reported HT use to be less common for women in the NE.[24,25,26] In our study, the majority of PCPs in our NW group were in family practice and those in the NE were internists. This makes it difficult to separate effects of geography and field of practice in

this group of providers. The lower prescribing frequency in the NE PCPs could be due to the higher percent of internists in this sample. An earlier study (2003) of U.S. physicians (633 OB/GYNs, 571 family practitioners, 410 internists) reported that internists were least likely to think that menopausal women should use HT.[18] However, this would not explain the lower HT prescribing in the NE that we observed in our OB/GYN group. Another possible explanation for the observed difference could be the methods we used to calculate the prescribing frequency at each site if our conversions of NE drug information (form, strength, and quantity) consistently underestimated days supply.

We observed higher HT prescribing by OB/GYNs compared to PCPs in bivariate analysis and this difference was virtually the same in an ad hoc analysis that adjusted for provider age, gender, practice location, and average age of women making visits. Using our measure of HT prescribing frequency it is conceivable that our denominator could contribute to this difference. It is possible that OB/GYNs in general only see patients once or twice a year but write HT prescriptions for the entire year where as PCPs may see patients for multiple conditions through out the year, creating a higher HT prescribing measure for OB/GYNs. In our multivariable analyses, we controlled for this possibility by stratifying on field of practice. Furthermore, other post-WHI studies support our findings. Hing and Brett noted that visits to gynecologists had a higher probability of resulting in HT prescription compared to visits by PCPs.[16] In addition, in the 2003 survey noted above, compared to family practice and internal medicine physicians, a higher percent of gynecologists reported that they strongly agreed that HT should be offered to menopausal women, were more supportive of longer durations of HT, and were more likely to note that combined HT reduces the risk of colon cancer.[18] Similar findings were reported from another survey sent to all PCPs in Florida in March of 2004 (10 % response rate; 203 OB/GYN, 145 internal medicine, 219 family practice).[27]

A few explanations have been offered for this difference. Higher HT use has been reported in women with hysterectomies,[15] and it may be more likely that hysterectomized women or women experiencing menopausal symptoms see gynecologists.[20] Or, gynecologists may ask about menopause symptoms more often. Another suggestion is that internists may more often treat the negative outcomes associated with HT use.[18] Alternately, OB/GYNs could receive training that is more focused in women's health and feel more confident in prescribing HT.[18] This concept seems to be supported in our sample in that 35% of our OB/GYNs and 15% of our PCPs felt very well prepared to counsel women on HT and 85% and 57% respectively felt that they had expert knowledge of the HERS and WHI trials.

In our study, greater provider confidence in the findings of the HT trials was independently related to higher HT prescribing for both OB/GYNs and PCPs. For OB/GYNs this equated to how well prepared they were to counsel patients about HT, for PCPs it was their knowledge of the trials. This is consistent with the findings from a 2003 American College of Obstetricians and Gynecologists survey of 703 Fellows reporting that providers with comprehensive knowledge of the WHI trials found the trial evidence less convincing.[28]

We also observed that the longer the OB/GYN or PCP had practiced at a specific health care organization the greater the HT prescribing frequency independent of their knowledge of the trials, their preparedness to counsel on HT, and their opinion on whether the risks of estrogen and progestogen had been exaggerate. Interestingly, in a report on family medicine physicians in Florida, faculty as compared to residents were more likely to use HT for treatment of menopausal symptoms.[17] Providers may carry forward practices learned while in training and it is possible that older providers were trained in an era of more positive beliefs about the benefits of HT.

Our study has several strengths. To our knowledge it is one of a few studies that assess characteristics of U.S. providers associated with HT prescribing after the release of the WHI findings and we used an objective, data based measure of HT prescribing frequency. Our study also has several limitations. A total of 49% of providers both completed the survey and consented to use of their automated prescription. Differential response could introduce a response bias in the study. We had limited data available to compare responders and non-responders; however, at the NW location both groups were similar in age, 50 and 49 years respectively. In addition, there was a similar proportion of non-response for PC (18%) and OB/GYN (16%) providers (p=0.6). However, of the respondents, more providers who self rated their prescribing practices as high compared to their colleagues nationally gave permission to use their automated data than those who rated those selves as low. Therefore, our findings may be more reflective of practitioners with a more favorable attitude toward HT. Our findings are also be more reflective of providers who mostly serve the insured population. We only had information on patient co-morbidity at the NW location so it was not included in our multivariate analysis. However, co-morbidity was highly correlated with patient age (correlation coefficient 0.69) which was included in the model and could partially account for co-morbidity in the population. Nor could we fully account for other characteristics of the patient population. In addition, our analysis does not address changes in dose or formulation of medication use, only days supply of medication.

Conclusion

Despite the downward trend in HT prescribing after the release of the WHI trial findings and in the context of similar practice guidelines, variation in prescribing practices associated with provider characteristics persist. The fact that HT prescribing was driven by years at the organization (a possible surrogate for age), region, self-rated trial knowledge and feeling prepared to counsel, suggests that HT prescribing may be driven by factors outside of evidence-based medicine. If this is true, practice variability could result in unequal exposure to HT's risk and benefits. This affects a very large proportion of U.S. women, who, when inquiring about HT risk and benefits deserve unbiased and well informed counseling to make informed decisions. It is likely that some doctors need additional training to ensure this level of advice.

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Table 1
Characteristics of responding providers overall and by field of practice

Characteristic	All[a] (n=249)	Primary Care (n=203)	Obstetrics/gynecology (n=46)	P-value
	Percents			
Provider gender Female	57	53	76	0.006
Type of practice Physician Other (nurse, physician assistant)	87 13	88 12	82 18	0.28
Geographic location[b] Northwest site Northeast site	71 29	74 26	59 41	0.04
Provider age <40 years 40- 49 years 50-59 years 60-78 years	15 27 48 10	17 26 47 10	7 33 51 9	0.35
Years of practice < 5 years 5-10 years > 10 years	7 12 81	8 13 79	7 7 86	0.62
Years at NW/NE organization < 3 years 3-10 years > 10 years	13 24 63	12 24 64	16 26 58	0.69
Mean rating of HERS & WHI knowledge[c] Limited knowledge Average knowledge Expert knowledge	15 23 62	18 25 57	2 13. 85	0.001
For women in my practice the WHI results are relevant (vs. irrelevant or average relevancy)	77	55	82	<0.001

[a] Number of missing observations: gender (n=2), practice type (n=1), provider age (n=6), years in practice (n=22), years at organization (n=3), WHI knowledge (n=1), relevancy of WHI results (n=23).

[b] Northwest site (Group Health), Northeast site (Harvard Vanguard Medical Associates)

[c] Heart and Estrogen/progestin Replacement Study (HERS), Women s Health Initiative (WHI)

Table 2

Bivariate analysis: The association between provider HT prescribing frequency based on automated data and self-report of prescribing frequency

Self reported measures	Mean HT Prescribing Frequency[a] (number of providers)	P-Value (F-test)
Self-described HT prescribing rate compared to colleagues nation-wide.		<0.001
1-2:High	21.7 (14)	
3:Average	11.7 (104)	
4-5:Low	6.6 (111)	
How would you rate your emphasis on discontinuation of HT		<0.001
1-2:Encourage discontinuation soon	7.8 (159)	
3-5: Average or let women using HT continue as long as they want	12.5 (88)	
In light of WHI I am less likely to recommend HT for menopause symptoms		0.001
4-5:Agree-strongly agree	8.7 (220)	
1-3:Neutral-strongly disagree	15.4 (28)	

[a]HT prescribing frequency: For the 12 month period prior to the survey, we divided the total days supply of estrogen fills for women age 45-80 written by a particular provider by the total number of visits made by women in the same age group to the provider.

Table 3

Bivariate analysis: Mean HT prescribing frequency by provider characteristic [a]

Question	Mean HT Prescribing Frequency [b] (number of providers)	P-Value
Provider Practice		
Site		
Northwest site	11.8 (177)	<0.001
Northeast site	3.7 (72)	
Field of practice		
Primary Care	7.5 (203)	<0.001
OB/GYN	18.1 (46)	
Type of practice		
Physician	9.4 (216)	0.64
Other (nurse, physician assistant)	8.6 (32)	
Years at health care organization		
<3	6.3 (29)	0.001
3-10	7.0 (55)	
11-37	11.5 (143)	
Years of practice		
<5	5.5 (17)	0.06
5-10	7.3 (27)	
11-25	10.0 (119)	
26-50	11.5 (64)	
Provider Characteristic		
Provider gender		
Female	10.0 (97)	0.19
Male	8.4 (79)	
Provider age		
<40 years	5.7 (38)	0.04
40- 49 years	9.4 (65)	
50-59 years	10.1 (116)	
60-78 years	11.8 (24)	
Female provider menopausal status		
Premenopausal	8.6 (64)	0.13
Menopausal transition	10.5 (22)	
Postmenopausal	13.2 (41)	
Is female provider taking HT		
Yes	18.4 (20)	0.001
No	9.0 (107)	
How likely is it that female provider will herself use HT in the future		
1-4:Average to Likely	12.7 (22)	0.02
5-7:Unlikely	7.7 (82)	

Question	Mean HT Prescribing Frequency [b] (number of providers)	P-Value
Patients visiting provider		
Average age of women being seen by provider		
≤ 56 years	18.0 (31)	<0.001
> 56years	8.2 (218)	
Average RX Risk score of women being seen by provider (NW only)		
upper tertile	9.3 (58)	0.02
lower tertile	13.0 (119)	
Provider perception of patient		
For perimenopausal women in my practice the WHI results are		
1-4: Irrelevant to average	12.5 (52)	0.03
5-7:Relevant	9.0 (174)	
Most women on HT want to come off		
1-2:Disagree	12.8 (81)	0.001
3-5:Neutral to agree	8.4 (144)	
Women want HT for libido, sleep, mood, or energy		
1-3:Disagree to neutral	7.7 (33)	0.16
4-5:Agree	10.3 (193)	
Providers perception of science and preparedness for HT counseling		
The risk of estrogen w/progestogen have been exaggerated		
1-3:Exaggerated	14.5 (56)	<0.001
4-7:Appropriately described to average	8.3 (130)	
Knowledge level of recent trials		
1-4:Limited to average	6.4 (85)	<0.001
5-7:Expert	12.0 (141)	
How prepared do you feel to counsel a woman about HT		
1-3:Somewhat to adequately	8.7 (185)	<0.001
4:Very well	14.9 (43)	

[a] All provider characteristics and other covariates were assessed. Only variables significant at and $\alpha \leq 0.20$ are included in this table.

[b] HT prescribing frequency: For the 12 month period prior to the survey, we divided the total days supply of estrogen fills for women age 45-80 written by a particular provider by the total number of visits made by women in the same age group to the provider.

Table 4

Multivariable models for regression of HT prescribing frequency on provider characteristics: model 1 for primary care providers and model 2 for OB/GYNs [a]

Characteristics	Beta = Adjusted Difference in HT Prescribing Frequency	95% Confidence Interval	P value
Model 1: Primary Care Provider Only			
Northeast (vs. Northwest)	-7.19	-9.18 to -5.20	<0.001
Years at health care organization	0.15	0.04 to 0.25	0.01
Average age of patient at visit (years)	-0.04	-0.30 to 0.23	0.81
Feel well prepared to counsel	-1.47	-3.85 to 0.91	0.18
Expert knowledge of trials	1.14	0.56 to 1.73	<0.001
Risk of EP appropriately described (vs. exaggerated)	-0.20	-0.74 to 0.34	0.48
WHI results relevant to women in my practice	0.26	-0.49 to 1.01	0.50
Agree women want to come off HT	-0.37	-1.00 to 0.26	0.25
Agree a scientific case has been made for colon cancer prevention	0.42	-0.48 to 1.33	0.33
Model 2: OB/GYNs Only			
Northeast (vs. Northwest)	-11.87	-18.97 to -4.77	0.001
Years at health care organization	0.60	0.18 to 1.02	0.01
Average age of patient at visit (years)	-1.69	-3.16 to -0.22	0.02
Feel well prepared to counsel	10.15	3.03 to 17.27	0.01
Expert knowledge of trials	-0.38	-3.82 to 3.07	0.78
Risk of EP appropriately described (vs. exaggerated)	-1.96	-3.85 to -0.07	0.04
WHI results relevant to women in my practice	-1.21	-3.52 to 1.11	0.33
Agree women want to come off HT	0.81	-1.68 to 3.31	0.49
Agree a scientific case has been made for colon cancer prevention	-0.94	-4.34 to 2.47	0.56

[a] P-values from linear regression model with provider prescribing frequency as the outcome and all variables listed in models as independent variables. All variables with p<0.1in the bivariate analyses were included in the multivariate models. Number of providers included in the regression analyses: 173 for model 1 (PCP) and 42 for model 2 (OB/GYN). Regression coefficients reflect mean difference in number of HT prescription days/visit for unit change in provider characteristic after controlling for other variables.