



# Menopause Management Knowledge in Postgraduate Family Medicine, Internal Medicine, and Obstetrics and Gynecology Residents: A Cross-Sectional Survey

Juliana M. Kling, MD, MPH; Kathy L. MacLaughlin, MD; Peter F. Schnatz, DO; Carolyn J. Crandall, MD, MS; Lisa J. Skinner, MD; Cynthia A. Stuenkel, MD; Andrew M. Kauntiz, MD; Diana L. Bitner, MD; Kristin Mara, MS; Karla S. Fohmader Hilsaca, PhD; and Stephanie S. Faubion, MD

## Abstract

**Objective:** To evaluate the knowledge of and nature of training for menopause management in postgraduate residents.

**Participants and Methods:** A cross-sectional, anonymous survey was e-mailed to trainees at all postgraduate levels in family medicine, internal medicine, and obstetrics and gynecology at US residency programs between January 11, and July 4, 2017. The survey was adapted from an existing instrument and included questions regarding knowledge of hormone therapy (HT) and other menopause management strategies, availability and type of training in menopause medicine, and demographic information.

**Results:** Of the 703 surveys sent, a total of 183 residents representing 20 US residency programs responded (26.0% response rate). Most trainees were between 26 and 30 years of age (133 of 172 [77.3%]), female (114 of 173 [65.9%]), and believed it was important or very important to be trained to manage menopause (165 of 176 [93.8%]). Although most respondents answered some of the menopause competency questions correctly, important gaps were identified. Of 183 participants, 63 (34.4%) indicated they would not offer HT to a symptomatic, newly menopausal woman without contraindications, and only 71 (38.7%) indicated they would prescribe HT until the natural age of menopause to a prematurely menopausal woman. Of 177 respondents, 36 (20.3%) reported not receiving any menopause lectures during residency, and only 12 of 177 (6.8%) reported feeling adequately prepared to manage women experiencing menopause.

**Conclusion:** Family medicine, internal medicine, and obstetrics and gynecology residency trainees recognize the importance of training in menopause management, but important knowledge gaps exist. Investing in the education of future clinicians to provide evidence-based, comprehensive menopause management for the growing population of midlife women is a priority.

© 2018 Mayo Foundation for Medical Education and Research ■ Mayo Clin Proc. 2019;94(2):242-253



For editorial  
comment, see  
page 191

Affiliations are at  
the end of this article.

The number of postmenopausal women in the United States is increasing and expected to exceed 50 million by the year 2020, and 75% or more will experience bothersome vasomotor symptoms (VMS).<sup>1</sup> Further, the direct and indirect health care costs associated with untreated VMS are estimated at nearly \$400

million annually,<sup>2</sup> and inpatient and outpatient costs are higher in women with untreated VMS.<sup>3</sup> Because menopause will occur in all women living beyond midlife, it is imperative that clinicians responsible for the primary care of women re-engage in menopause management.<sup>4</sup> In addition to obstetrician-gynecologists (OB/GYNs),

internal medicine (IM) and family medicine (FM) physicians are appropriately situated and well suited to provide menopausal management inasmuch as they care for many menopausal women and systems affected by menopause and hormone therapy (HT) (eg, bone, brain, heart). Clinicians in all 3 specialties will need to be involved given the expanding number of women affected and the enormous symptom prevalence.

Before publication of the Women's Health Initiative (WHI) combined HT trial results in 2002, menopausal HT was widely accepted as safe and appropriate, not only for management of menopausal symptoms but also for cardioprotection and chronic disease prevention, even in asymptomatic women.<sup>5-8</sup> By some estimates, as many as 40% of women were taking HT.<sup>9</sup> The WHI trial results raised concerns regarding the risks of cardiovascular disease and breast cancer in women utilizing the combination of conjugated equine estrogens and medroxyprogesterone acetate.<sup>10</sup> As a result, many clinicians stopped prescribing HT.<sup>11</sup> General practitioners, including internists and FM physicians, had a steeper decline in HT prescribing compared to OB/GYNs, and by 2009, 18% of HT prescriptions were written by internists/FM physicians vs 82% by OB/GYNs.<sup>12,13</sup>

Updated analyses have revealed that HT is appropriate and safe for symptom relief in younger, recently menopausal women without contraindications,<sup>1,14,15</sup> and the risks identified in the WHI trials apply primarily to women who initiate HT after age 60 years and more than a decade after menopause.<sup>13,16,17</sup> Eighteen-year follow-up data from the WHI trials revealed no difference in long-term all-cause and cause-specific mortality in women treated with HT vs placebo,<sup>18</sup> providing additional reassurance. Organizations across disciplines, including the North American Menopause Society (NAMS), the Endocrine Society, and the American College of Obstetricians and Gynecologists have issued guidelines supporting the use of HT in symptomatic women early in menopause.<sup>1,19,20</sup>

Although the balance of benefits and risks of systemic HT has never been clearer, few healthy symptomatic women younger than

60 years are being evaluated, treated, or referred for management of menopausal symptoms.<sup>19,21</sup> Many women say that their clinicians do not recognize the importance of menopause symptoms, and they perceive reluctance among clinicians to offer HT as a treatment option.<sup>22</sup> Whether that reluctance reflects outdated perceived risks of HT or simply avoidance of an unfamiliar, and therefore uncomfortable, clinical issue is unclear. Clinical training is critical to familiarize clinicians with menopausal symptoms and available treatments and guidelines.

It is unclear to what extent resident trainees recognize symptoms and signs of menopause, and accordingly, provide evidence-based recommendations for menopause management. Furthermore, it is unknown whether residents are familiar with nonhormonal options for treating menopausal symptoms in women who have contraindications or choose not to use HT.

There are gaps in training specific to women's health in primary care residency programs, in part due to limited training opportunities.<sup>4,23-25</sup> In a study by Hsieh et al,<sup>23</sup> 50% of surveyed IM residents expressed a low comfort level, and 80% of respondents reported limited training opportunities, in managing menopause symptoms. In another similar survey study, IM resident knowledge of HT and menopause management was low despite residents reporting exposure to didactics (80% reporting >1 didactic).<sup>25</sup> Although IM program directors have also reported women's health topics as a priority for their residents, training opportunities are limited and menopause management is not consistently included in core curricula.<sup>24</sup> Similarly, in a survey by Christianson et al,<sup>26</sup> 75.8% of OB/GYN residents reported feeling "barely comfortable" managing menopause. Given the complex decision making needed for menopause management, including understanding of the benefit/risk profile of HT, the adequacy of menopause training in US residency programs producing clinicians who will be in the position of caring for symptomatic menopausal women warrants further assessment. We aimed to evaluate knowledge and competency regarding menopause

**TABLE 1. Characteristics of Residency and 183 Participants**

Variable	No. (%)
Type of training program (N=173)	
Internal medicine	86 (49.7)
Family medicine	16 (9.2)
Obstetrics and gynecology	68 (39.3)
Other (medicine/pediatrics)	3 (1.7)
Postgraduate year (N=174) <sup>a</sup>	
1	52 (29.7)
2	48 (27.4)
3	56 (32.0)
4	18 (10.3)
Age (y) (N=172)	
21-25	2 (1.2)
26-30	133 (77.3)
31-35	32 (18.6)
36-40	2 (1.2)
41-45	1 (0.6)
46-50	2 (1.2)
Sex (N=173)	
Male	59 (34.1)
Female	114 (65.9)

<sup>a</sup>The percentages were calculated based on the total of respondents completing that question (174). The Table does not include the one respondent that listed other (to make the total 174).

management in US FM, IM, and OB/GYN residents with the goal of identifying gaps to highlight opportunities for improvement in education.

## PARTICIPANTS AND METHODS

A cross-sectional, anonymous e-mail survey was administered to trainees from all postgraduate levels in FM, IM, and OB/GYN at 20 residency programs across the United States between January 11, and July 4, 2017. Residency programs were identified through solicitation within professional organizations and professional networks. Those who responded to the solicitation, primarily practicing clinicians at community-based and academic institutions, shared information about the opportunity with residency program directors at their respective institutions. Of those programs contacted, all but one chose to participate. Thus, a convenience sample was used. Because no validated survey tool exists for topics related to menopause management, our survey was adapted with permission from

an instrument developed by the Seattle Group Health Cooperative to evaluate attitudes influencing HT prescribing by practicing physicians.<sup>27</sup> The survey consists of 3 parts, with questions regarding knowledge of HT and other menopause management strategies, availability and type of training on menopause medicine, and participant demographic information (Supplemental Material, available online at <http://www.mayoclinicproceedings.org>). The authors of this report, content experts from the Mayo Clinic and the NAMS, reviewed the instrument and provided recommendations to optimize assessment of participants' knowledge and competencies. The survey questions were based on current guidelines and expert consensus regarding menopause management.<sup>1,19,20</sup> After development of the instrument, a small focus group of 6 residents from Mayo Clinic (mix of FM, IM, and OB/GYN) reviewed the survey tool for face validity. Risks to participants were deemed minimal, and the study was exempted by the Mayo Clinic Institutional Review Board.

Once the tool was developed and approval was obtained by the Mayo Clinic School of Graduate Medical Education deans, program directors from the Mayo Clinic training sites were contacted and approval was requested to administer the e-mail survey to all residents in their respective departments. Similar approval was sought at participating academic training centers (Table 1) to allow for e-mail distribution of the survey to postgraduate residents. Eligible resident participants received a maximum of 3 e-mail requests for completion of the survey to optimize the response rate.

Participants who completed the survey received the consumer resource *Mayo Clinic The Menopause Solution*<sup>28</sup> (\$10 value). After completing the survey, resident respondents were directed to a separate Web page (to ensure that survey responses remained anonymous) to request the book. This information was gathered by the individual training programs, and program coordinators at each site distributed the books to respondents.

Qualtrics survey software was utilized to administer the survey and collect data. Data were summarized using mean  $\pm$  SD or median (interquartile range) for continuous variables

**TABLE 2. Menopause Knowledge Questions and Answers, Stratified by Specialty<sup>a,b,c,d</sup>**

Question	Total (N=183)	Family medicine (N=16)	Internal medicine (N=86)	OB/GYN (N=68)	P value
The diagnosis of menopause requires which of the following:					.001
12 months of amenorrhea	151 (82.5)	14 (87.5)	64 (74.4)	64 (94.1)	
An elevated follicle-stimulating hormone (FSH) level	4 (2.2)	0	2 (2.3)	1 (1.5)	
Presence of vasomotor symptoms (hot flashes/night sweats)	1 (0.5)	1 (6.3)	0	0	
All of the above	26 (14.2)	1 (6.3)	20 (23.3)	3 (4.4)	
Symptoms of menopause include: (choose all that apply)					
Vasomotor symptoms	181 (98.9)	16 (100.0)	86 (100.0)	67 (98.5)	.47
Fever	13 (7.1)	2 (12.5)	7 (8.1)	3 (4.4)	.45
Vaginal dryness	180 (98.4)	16 (100.0)	84 (97.7)	68 (100.0)	.37
Mood disturbance	173 (94.5)	15 (93.8)	84 (97.7)	62 (91.2)	.20
Fatigue	152 (83.1)	15 (93.8)	74 (86.0)	55 (80.9)	.39
Difficulty with memory/concentration	132 (72.1)	15 (93.8)	56 (65.1)	53 (77.9)	.03
Dementia	7 (3.8)	1 (6.3)	2 (2.3)	4 (5.9)	.49
Sleep disturbance	161 (88.0)	15 (93.8)	72 (83.7)	63 (92.6)	.18
Joint pain	21 (11.5)	0	8 (9.3)	11 (16.2)	.13
Weight loss	13 (7.1)	0	5 (5.8)	8 (11.8)	.19
The average age at natural menopause in the U.S. is					.09
45	5 (2.7)	0	5 (5.8)	0	
52	165 (90.2)	14 (87.5)	73 (84.9)	66 (97.1)	
56	9 (4.9)	2 (12.5)	7 (8.1)	0	
60	2 (1.1)	0	1 (1.2)	1 (1.5)	
I don't know	2 (1.1)	0	0	1 (1.5)	
If a 48-year-old woman presents with heavy menstrual bleeding lasting greater than 10 days after 2 months of amenorrhea, you should check:					.39
A pregnancy test	29 (15.8)	1 (6.3)	16 (18.6)	8 (11.8)	
Pelvic ultrasound	5 (2.7)	0	4 (4.7)	1 (1.5)	
Endometrial biopsy	8 (4.4)	0	2 (2.3)	5 (7.4)	
Complete blood cell count (CBC) and thyroid function studies	9 (4.9)	1 (6.3)	5 (5.8)	2 (2.9)	
All of the above	131 (71.6)	14 (87.5)	59 (68.6)	52 (76.5)	
A 53-year-old woman presents with severe vasomotor symptoms. All but which of the following are contraindications to the use of MHT?					.03
History of myocardial infarction	14 (7.7)	2 (12.5)	5 (5.8)	5 (7.4)	
History of stroke	2 (1.1)	0	2 (2.3)	0	
History of hypertension	130 (71.0)	12 (75.0)	67 (77.9)	44 (64.7)	
History of venous thromboembolism	8 (4.4)	1 (6.3)	6 (7.0)	1 (1.5)	
History of breast cancer	25 (13.7)	1 (6.3)	5 (5.8)	18 (26.5)	
Did not answer	4 (2.2)	0	1 (1.2)	0	
For a 51-year-old woman with severe vasomotor symptoms who has a uterus and no contraindications to the use of MHT, which of the following would you recommend?					.04
Systemic estrogen only	14 (7.7)	0	7 (8.1)	7 (10.3)	
Systemic estrogen plus a progestogen	158 (86.3)	16 (100.0)	71 (82.6)	61 (89.7)	
Progestogen only	8 (4.4)	0	8 (9.3)	0	

Continued on next page

TABLE 2. Continued

Question	Total (N=183)	Family medicine (N=16)	Internal medicine (N=86)	OB/GYN (N=68)	P value
A 58-year-old woman with a uterus presents with severe vaginal dryness and dyspareunia despite use of lubricants with intercourse and vaginal moisturizers. She has no significant vasomotor symptoms. Which of the following would you recommend?					.15
Systemic estrogen only	1 (0.5)	0	0	1 (1.5)	
Systemic estrogen plus a progestogen	6 (3.3)	0	5 (5.8)	1 (1.5)	
<i>Low dose vaginal estrogen</i>	158 (86.3)	15 (93.8)	70 (81.4)	64 (94.1)	
Low dose vaginal estrogen plus a progestogen	15 (8.2%)	1 (6.3)	11 (12.8)	2 (2.9)	
Women should be informed that the benefits of MHT generally outweigh the risks for women with bothersome vasomotor symptoms who are under age 60 and within 10 years of menopause					.001
<i>Strongly agree</i>	45 (25.6)	9 (56.3)	16 (18.6)	20 (29.9)	
Agree	87 (49.4)	6 (37.5)	38 (44.2)	38 (56.7)	
Neither agree nor disagree	32 (18.2)	1 (6.3)	22 (25.6)	8 (11.9)	
Disagree	12 (6.8)	0	10 (11.6)	1 (1.5)	

<sup>a</sup>MHT = menopause hormone therapy; OB/GYN = obstetrician-gynecologist.

<sup>b</sup>Data are presented as No. (percentage) of participants based on totals provided for each group (some participants did not answer all questions, and numbers for specialties shown do not always match total for answer option).

<sup>c</sup>Italicized answer choice is the correct answer.

<sup>d</sup>Percentages in the Total and OB/GYN columns are based on the sum of the numbers for the answer options rather than the total shown below the heading; there is one missing data point in Total and one missing data point in OB/GYN.

and frequency counts and percentages for nominal variables. Scores for knowledge, competency, comfort level, and training were calculated, and comparisons across specialties (FM, IM, and OB/GYN) and by sex were made using the Kruskal-Wallis test or analysis of variance for continuous variables and the  $\chi^2$  or Fisher exact test for nominal variables. In all cases, 2-tailed  $P < .05$  was considered statistically significant.

## RESULTS

Twenty US FM, IM, and OB/GYN residency training programs participated in the survey. Of 703 surveys sent, 183 were at least partially completed (response rate of 26.0%); response rates were similar by specialty (IM, 86/368 [23.4%]; OB/GYN, 68/246 [27.6%]; and FM, 16/65 [24.6%];  $P = .49$ ). Thirteen of the 20 programs were academic programs (65%), and the remainder were community based. Most residents were between 26 and 30 years of age (133 of 172 [77.3%]), and 114 of 173 who

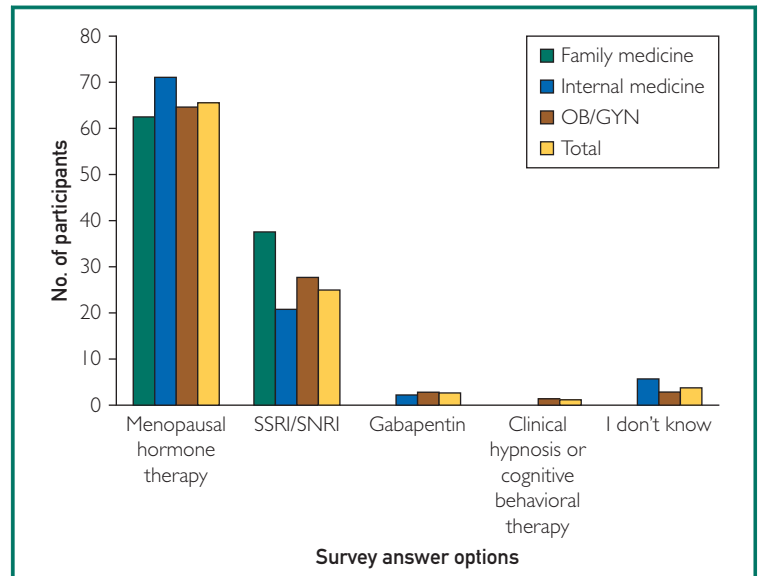
provided information on sex (65.9%) were female (Table 1).

Although most respondents answered some of the menopause knowledge and competency questions correctly, important knowledge gaps were identified. Table 2 displays the responses to the knowledge questions overall and by medical specialty. Of 183 participants who provided information, 63 (34.4%) failed to offer HT to a severely symptomatic, recently menopausal woman without medical contraindications, with no significant differences based on residency type (Figure 1) ( $P = .7$ ). Only 71 of 183 respondents (38.7%) indicated they would provide HT until the age of 50 years to a prematurely menopausal woman (age 39 years) without contraindications (Figure 2). Most respondents (130 of 183 [71.0%]) correctly identified contraindications to the use of HT, and 158 of 183 (86.3%) correctly identified the need for the addition of progestogen to estrogen therapy for a woman with an intact uterus. Of the 176 participants who

responded, 132 (75.0%) indicated that they agreed or strongly agreed that women should be informed that the benefits of HT generally outweigh the risks in younger, symptomatic, recently menopausal women, but there were significant differences between residency types ( $P=.001$ ). Most respondents correctly identified low-dose vaginal estrogen as appropriate therapy for vaginal dryness and dyspareunia.

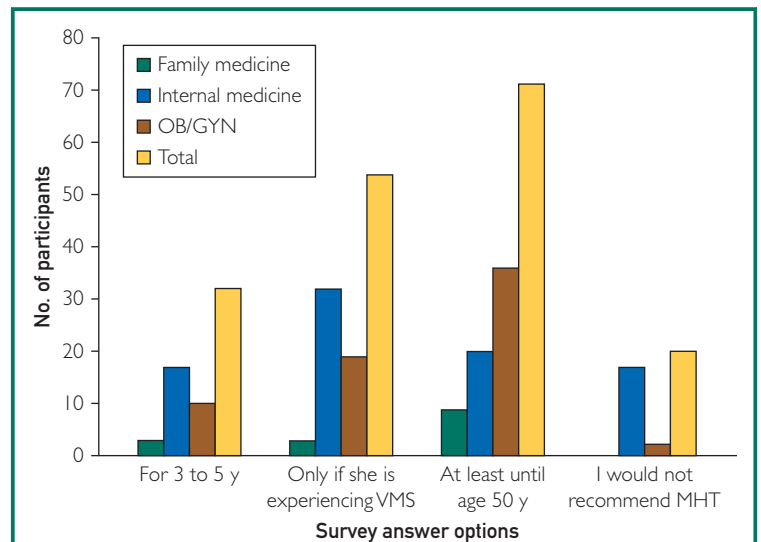
The most commonly recommended approaches to treat recurrent VMS after HT discontinuation were behavioral changes (104 of 183 [60.1%]), exercise (91 of 183 [52.6%]), weight loss (76 of 183 [44.2%]), mind-body approaches (42 of 183 [24.4%]), and selective serotonin reuptake inhibitor (40 of 183 [23.4%]) or serotonin norepinephrine reuptake inhibitor therapy (39 of 183 [22.7%]). Of 171 respondents, 94 (54.9%) indicated they recommend resuming HT for recurrent symptoms sometimes, and only 18 out of 183 (10.5%) did so often. Respondents marked “never” as a choice to treat recurrent VMS with gabapentin (50 of 172 [29.1%]), clonidine (94 of 170 [55.3%]), hypnosis (108 of 170 [63.5%]), and cognitive behavioral therapy (53 of 172 [30.8%]) (Figure 3).

Overall, 104 of 177 residents (58.8%) reported having up to one lecture or didactic session on menopause management during residency, 36 of whom (20.3%) reported receiving no lectures (Table 3). On average, OB/GYN residents had a greater number of menopause-focused lectures than did FM or IM residents. Evaluation by postgraduate level revealed that those further in training reported more lectures in menopause management (8 out of 18 [44.4%]) of residents in postgraduate year (PGY) 4 reported more than 4 lectures vs none of the residents in PGY-1;  $P<.001$ ). Still, 4 out of 18 PGY-4 residents (22%) reported receiving 0 to 1 lecture in menopause management. Most residents reported caring for 1 to 5 symptomatic menopausal women in their respective residency continuity clinics, and 30 of 176 (17.0%) indicated they cared for no symptomatic menopausal women. Additionally, most residents reported being only somewhat prepared to manage women experiencing menopause,

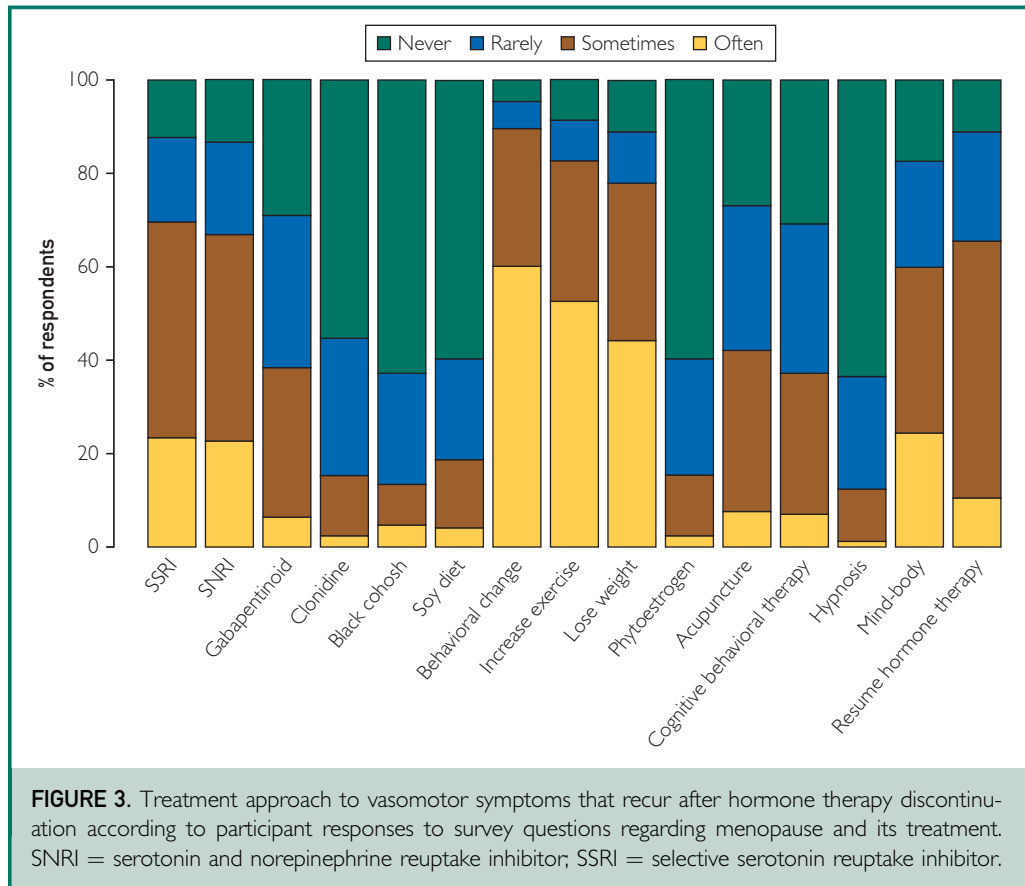


**FIGURE 1.** First-choice treatment for a woman with severe vasomotor symptoms according to participant responses to survey questions regarding menopause and its treatment. OB/GYN = obstetrician-gynecologist; SNRI = serotonin and norepinephrine reuptake inhibitor; SSRI = selective serotonin reuptake inhibitor.

and more than a third said they were not prepared at all. Only 12 of 177 (6.8%) reported feeling adequately prepared to manage women



**FIGURE 2.** Hormone therapy recommendations to a 39-year-old healthy woman who experienced early menopause according to participant responses to survey questions regarding menopause and its treatment. MHT = menopausal hormone therapy; OB/GYN = obstetrician-gynecologist; VMS = vasomotor symptoms.



experiencing menopause. Similar findings were seen when evaluating self-rated preparedness by PGY level (somewhat prepared: PGY-1, 27 of 52 [51.9%]; PGY-2, 24 of 48 [50%]; PGY-3, 32 of 56 [57.1%]; PGY-4, 9 of 18 [50%]), although the percentage that reported feeling not at all prepared was lower at the PGY-4 level than at the PGY-1 level (4 of 18 [22.2%] vs 22 of 52 [42.3%];  $P=.04$ ). Despite this feeling of being unprepared, 165 of 176 trainees (93.8%) reported it was important or very important to be trained to manage menopause, which was similar across years of training ( $P=.13$ ).

Residents were asked how strongly they would encourage family members to utilize HT for symptom management. Overall, 93 of 177 (52.5%) responded with a 4 or 5 on a 7-point scale in which 7 represented strongly disagree. Of the FM and OB/GYN residents, 3 of 16 (18.8%) and 11 of 68 (16.2%), respectively, indicated they would strongly encourage symptomatic menopausal family

members to utilize HT, whereas only 1 of 86 (1.2%) of IM residents indicated they would strongly encourage such relatives to use HT.

In subanalysis evaluating survey responses by participant gender (female vs male), a few statistically significant differences were seen. Female respondents were more likely to correctly diagnose menopause than male respondents (102 of 114 [89.5%] vs 42 of 59 [71.2%];  $P=.002$ ); they were more likely to restart HT for recurrent symptoms after discontinuation of HT (76 of 107 [71.0%] often or sometimes vs 32 of 59 [54.2%];  $P=.01$ ), and they were more likely to indicate that training in menopause was very important or important (108 of 113 [95.6%] vs 53 of 59 [89.8%];  $P=.006$ ). Responses to other questions were similar between sexes.

## DISCUSSION

Menopause practice has been subject to a rapidly evolving knowledge base regarding the safety profile of HT since the WHI trial

**TABLE 3. Menopause Training Questions, Stratified by Specialty<sup>a,b</sup>**

Question	Total (N=183)	Family medicine (N=16)	Internal medicine (N=86)	OB/GYN (N=68)	P value
How prepared do you feel to manage women going through menopause?					<.001
Not at all prepared	67 (37.9)	3 (18.8)	43 (50.0)	19 (27.9)	
Somewhat prepared	95 (53.7)	8 (50.0)	42 (48.8)	40 (58.8)	
Adequately prepared	12 (6.8)	4 (25.0)	1 (1.2)	7 (10.3)	
Very well prepared	3 (1.7)	1 (6.3)	0	2 (2.9)	
Please rate how important you think it is to be trained to manage menopause					<.001
Very important	91 (51.7)	14 (87.5)	27 (31.8)	46 (67.6)	
Important	74 (42.0)	2 (12.5)	48 (56.5)	21 (30.9)	
Neutral	8 (4.5)	0	7 (8.2)	1 (1.5)	
Unimportant	1 (0.6)	0	1 (1.2)	0	
Very unimportant	2 (1.1)	0	2 (2.4)	0	
How many lectures/didactics regarding menopause management have you received during your residency?					<.001
0	36 (20.3)	4 (25.0)	23 (26.7)	6 (8.8)	
1	68 (38.4)	8 (50.0)	43 (50.0)	14 (20.6)	
2	31 (17.5)	3 (18.8)	14 (16.3)	13 (19.1)	
3	24 (13.6)	1 (6.3)	4 (4.7)	19 (27.9)	
≥4	18 (10.2)	0	2 (2.3)	16 (23.5)	
How many symptomatic menopausal women have you cared for in your continuity clinic residency?					<.001
None	30 (17.0)	0	20 (23.3)	10 (14.7)	
1-5	99 (56.3)	5 (31.2)	60 (69.8)	31 (45.6)	
6-10	28 (15.9)	5 (31.2)	4 (4.7)	17 (25.0)	
11-20	11 (6.3)	3 (18.8)	1 (1.2)	6 (8.8)	
21-30	5 (2.8)	2 (12.5)	1 (1.2)	2 (2.9)	
>30	3 (1.7)	1 (6.2)	0	2 (2.9)	

<sup>a</sup>OB/GYN = obstetrician-gynecologist.

<sup>b</sup>Data are presented as No. (percentage) of participants based on totals provided for each group (some participants did not answer all questions, and numbers for specialties shown do not always match total for answer option).

results were first presented in 2002. As more evidence mounts regarding the favorable balance of risks and benefits of HT for symptomatic women in early menopause, as emphasized in the 2017 NAMS position statement,<sup>1</sup> the Endocrine Society clinical practice guidelines,<sup>19</sup> and the American College of Obstetricians and Gynecologists committee opinion,<sup>20</sup> and as more nonhormonal options for management of menopausal symptoms become available,<sup>29</sup> it is increasingly important to ensure that trainees in all disciplines that care for women are exposed to these topics so that they are prepared to treat symptomatic menopausal women and understand the indications for HT (eg, prevention of bone loss). Our study found that a vast majority of trainees

from a broad geographic sample, regardless of specialty, recognize the importance of training in menopause management; nonetheless, many did not feel adequately prepared, as similarly identified in smaller specialty-specific studies.<sup>23,26</sup> In fact, nearly 40% of respondents in our study reported that they were not at all prepared to manage women entering menopause, including 19 of 56 PGY-3 residents (33.9%) and 4 of 18 PGY-4 level trainees (22.2%) nearing completion of their training programs. Moreover, a majority reported minimal or no didactic instruction and that they cared for few symptomatic women in their continuity clinics. The fact that 17.0% of respondents indicated that they cared for no symptomatic menopausal women raises the



question of whether they simply never recognized and identified symptomatic menopausal women, given that most residents should have the opportunity to care for women between the ages of 45 and 60 years during their training.

Although participants answered many of the menopause knowledge questions correctly, some clear knowledge gaps were identified, including in evolving areas not thoroughly assessed in past studies. Over a third of respondents (34.4%) would not recommend HT as a first-line therapy for a severely symptomatic, recently menopausal 52-year-old woman without contraindications. This finding is notable, particularly as current evidence supports and guidelines recommend HT as a safe and highly effective treatment for menopausal symptoms.<sup>1,19,28,30</sup> Even more remarkable, 106 of 177 residents (59.9%) did not recommend appropriate and adequate HT at least until the natural age of menopause for a prematurely menopausal woman, and some even recommended *against* it. This is an important issue because multiple observational studies suggest that women experiencing premature menopause who do not take HT at least until the natural age of menopause are at increased risk for multiple adverse long-term health outcomes, including osteoporosis, coronary heart disease, cognitive impairment, dementia, parkinsonism, mood disorders, sexual dysfunction, accelerated aging, and even premature death.<sup>31-34</sup>

A quarter of respondents did not agree that women should be counseled that the benefits of HT generally outweigh the risks for symptomatic women under the age of 60 years and within 10 years of menopause, with significant differences among residency types: 37.2% of IM residents did not affirm this statement. Practicing clinicians who are more knowledgeable about published HT trials are more likely to appropriately prescribe HT to symptomatic women<sup>35</sup>; therefore, assuring that trainees are exposed to, and understand, important findings of HT trials and guidelines may narrow these gaps. It has been proposed that a set of core competencies related to menopause management

be established to facilitate improved education for all levels of medical training and practice, especially for general internists.<sup>21,36</sup> Because menopause affects all reproductively competent women who live long enough, prioritizing menopause topics in existing curricula should be considered. Specific activities that have been associated with trainee attitudes that reflect current knowledge regarding HT include participation in a rotation and/or attending a lecture on menopause management and having a continuity clinic with at least 30% female patients.<sup>24</sup> Additional educational tools, including a comprehensive, widely available menopause curriculum, and dedicated menopause clinics can improve education regarding the clinical management of menopausal women.<sup>37</sup> Online curricular modules on menopause management may also provide easy access to additional educational opportunities for residents.

Additional learning opportunities were also identified in the survey. Few residents (11.5%) correctly identified joint pain as a symptom associated with menopause.<sup>38,39</sup> Just over a quarter of respondents (49 out of 176 [27.8%]) knew to counsel women about the increased risk of gallbladder disease with oral estrogen use, and 25 of 179 respondents (13.9%) did not identify breast cancer as a contraindication to HT. A few differences were seen by participant sex, including correctly defining menopause. These knowledge gaps could easily be addressed with resident education.

The 2015 NAMS recommendation for nonhormonal management of VSM reviews evidence-supported therapies for women who have contraindications or choose not to use HT.<sup>29</sup> Recommended therapies include cognitive behavioral therapy, clinical hypnosis, low-dose paroxetine salt, selective serotonin reuptake inhibitors/serotonin and norepinephrine reuptake inhibitors, gabapentinoids (gabapentin and pregabalin), and clonidine. In our survey, respondents commonly reported never recommending these alternatives to HT when treating women with recurrent VMS, highlighting another learning priority.

The drivers behind the lack of knowledge and unfavorable attitudes regarding HT prescribing by medical trainees are likely multifactorial and may stem, in part, from residual ambivalence in educators in response to the publicity generated during the initial release of the WHI trial findings in 2002.<sup>17</sup> Contributing factors may include the rapidly expanding knowledge base regarding the benefits and risks of HT, a lack of exposure to healthy menopausal women in continuity clinics, or, especially for IM and FM physicians, a lack of “ownership” of menopause as a relevant clinical issue.<sup>40</sup> Alternatively, menopause education may not reflect current evidence and may therefore translate to a lack of adequate and accurate educational materials. The US Preventive Services Task Force grade D recommendation against HT for primary prevention in postmenopausal women<sup>41</sup> may also negatively influence prescribing practices, particularly in IM and FM communities, because the US Preventive Services Task Force recommendations are valued resources in these fields, despite a specific statement that the recommendation does not address HT use in symptomatic women or in prematurely menopausal women. Given the large and increasing numbers of menopausal women, the majority of whom will experience menopausal symptoms, it is critical that medical trainees who will ultimately be responsible for the care of midlife women receive adequate, appropriate evidence-based education.

The strength of this study is the broad geographic representation of US trainees surveyed. A limitation is the relatively low response rate of 26.0%, which may relate to the demanding training schedule and, possibly, survey fatigue or apathy regarding menopause management. Other resident surveys report similar response rates, ranging from 17% to 30%,<sup>42-44</sup> although some have shown higher response rates (72%) using different formats for survey distribution such as mailing.<sup>45</sup> Because residency programs with connections to menopause experts were utilized for recruitment and a consumer resource related to

menopause was used as the incentive, a response bias among the group responding to the survey is possible. Our survey tool was not tested for validity and reliability, and the survey may not have adequately assessed what it was intended to assess. There are no validated questionnaires on this topic, so content expert input was utilized in the development of the survey, and resident focus groups were used to assure readability and understanding.

## CONCLUSION

Although FM, IM, and OB/GYN residency trainees recognize the importance of training in menopause management, important educational gaps were identified with resultant learning opportunities for trainees and residency programs. Specifically, didactic education regarding awareness and recognition of menopausal symptoms, risks and benefits of HT, alternatives to HT for symptom relief, HT in the setting of premature menopause, and the selection of appropriate candidates for HT should be included. In addition, clinical rotations focusing on menopause management should be implemented when feasible. Given the number of women who will experience symptoms of menopause and the considerable associated burden to their health and to the health care system, it is important to invest in educating future clinicians to provide evidence-based, comprehensive menopause management.

## SUPPLEMENTAL ONLINE MATERIAL

Supplemental material can be found online at <http://www.mayoclinicproceedings.org>. Supplemental material attached to journal articles has not been edited, and the authors take responsibility for the accuracy of all data.

**Abbreviations and Acronyms:** FM = family medicine; HT = hormone therapy; IM = internal medicine; NAMS = North American Menopause Society; OB/GYN = obstetrician-gynecologist; PGY = postgraduate year; VMS = vasomotor symptoms; WHI = Women's Health Initiative

**Affiliations:** From the Division of Women's Health Internal Medicine, Mayo Clinic, Scottsdale AZ (J.M.K.); Department of Family Medicine (K.L.M.), Division of Biomedical Statistics and Informatics, Department of Health Sciences Research

(K.M.), and Women's Health Clinic, Division of General Internal Medicine (K.S.F.H., S.S.F.), Mayo Clinic, Rochester, MN; Department of OB/GYN and Internal Medicine, Reading Hospital, Reading, PA, and Thomas Jefferson University, Philadelphia, PA (P.F.S.); Department of Medicine, David Geffen School of Medicine at University of California, Los Angeles (C.J.C., L.J.S.); Department of Medicine, Division of Endocrinology, University of California, San Diego, School of Medicine, La Jolla, CA (C.A.S.); Department of Obstetrics and Gynecology, University of Florida College of Medicine—Jacksonville (A.M.K.); and Department of Obstetrics and Gynecology, Spectrum Health/Michigan State University, Grand Rapids, MI (D.L.B.).

**Potential Competing Interests:** Dr Kaunitz is a consultant for Bayer HealthCare Pharmaceuticals Inc, Mithra Pharmaceuticals, Sebela Pharmaceuticals Inc, and Shionogi Inc; he receives research grants (funds paid to University of Florida) from Allergan, Bayer HealthCare Pharmaceuticals Inc, Endoceutics, Inc, Mithra Pharmaceuticals, and TherapeuticsMD, Inc. Dr Bitner has received speaker's fees from AMAG Pharmaceuticals. Dr Faubion is a consultant for Mithra Pharmaceuticals and Procter & Gamble. The other authors report no competing interests.

**Correspondence:** Address to Juliana M. Kling, MD, MPH, 13737 N 92nd St, Scottsdale, AZ 85260 ([klingjuliana@mayo.edu](mailto:klingjuliana@mayo.edu)).

## REFERENCES

- NAMS 2017 Hormone Therapy Position Statement Advisory Panel. The 2017 hormone therapy position statement of The North American Menopause Society. *Menopause*. 2017;24(7):728-753.
- Sarrel P, Portman D, Lefebvre P, et al. Incremental direct and indirect costs of untreated vasomotor symptoms. *Menopause*. 2015;22(3):260-266.
- Tan WY, Grothe D, Keshishian A, Morgenstern D, Haider S. Pharmacoeconomic and associated cost savings among women who were prescribed systemic conjugated estrogens therapy compared with those without menopausal therapy. *Menopause*. 2017;25(5):493-499.
- Manson JE, Kaunitz AM. Menopause management—getting clinical care back on track. *N Engl J Med*. 2016;374(9):803-806.
- Carr BR, Wilson JD. Disorders of the ovary and female reproductive tract. In: Isselbacher KJ, Braunwald E, Wilson JD, Martin JB, Fauci AS, Kasper DL, eds. *Harrison's Principles of Internal Medicine*. 13th ed. New York, NY: McGraw-Hill; 1994: 2016-2017.
- Davidson MH, Maki KC, Marx P, et al. Effects of continuous estrogen and estrogen-progestin replacement regimens on cardiovascular risk markers in postmenopausal women. *Arch Intern Med*. 2000;160(21):3315-3325.
- Grodstein F, Manson JE, Colditz GA, Willett WC, Speizer FE, Stampfer MJ. A prospective, observational study of postmenopausal hormone therapy and primary prevention of cardiovascular disease. *Ann Intern Med*. 2000;133(12):933-941.
- Grady D, Rubin SM, Petitti DB, et al. Hormone therapy to prevent disease and prolong life in postmenopausal women. *Ann Intern Med*. 1992;117(12):1016-1037.
- Steinkellner AR, Denison SE, Eldridge SL, Lenzi LL, Chen W, Bowlin SJ. A decade of postmenopausal hormone therapy prescribing in the United States: long-term effects of the Women's Health Initiative. *Menopause*. 2012;19(6):616-621.
- Rossouw JE, Anderson GL, Prentice RL, et al; Writing Group for the Women's Health Initiative Investigators. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: principal results from the Women's Health Initiative randomized controlled trial. *JAMA*. 2002;288(3):321-333.
- Majumdar SR, Almasi EA, Stafford RS. Promotion and prescribing of hormone therapy after report of harm by the Women's Health Initiative. *JAMA*. 2004;292(16):1983-1988.
- Tsai SA, Stefanick ML, Stafford RS. Trends in menopausal hormone therapy use of US office-based physicians, 2000-2009. *Menopause*. 2011;18(4):385-392.
- Santen RJ, Allred DC, Ardoin SP, et al. Postmenopausal hormone therapy: an Endocrine Society scientific statement. *J Clin Endocrinol Metab*. 2010;95(7, suppl 1):S1-S66.
- North American Menopause Society. The 2012 hormone therapy position statement of The North American Menopause Society. *Menopause*. 2012;19(3):257-271.
- de Villiers TJ, Gass ML, Haines CJ, et al. Global consensus statement on menopausal hormone therapy. *Climacteric*. 2013;16(2):203-204.
- Rossouw JE, Manson JE, Kaunitz AM, Anderson GL. Lessons learned from the Women's Health Initiative trials of menopausal hormone therapy. *Obstet Gynecol*. 2013;121(1):172-176.
- Manson JE, Chlebowski TR, Stefanick ML, et al. Menopausal hormone therapy and health outcomes during the intervention and extended poststopping phases of the Women's Health Initiative randomized trials. *JAMA*. 2013;310(13):1353-1368.
- Manson JE, Argaki AK, Rossouw JE, et al. WHI Investigators. Menopausal hormone therapy and long-term all-cause and cause-specific mortality: the Women's Health Initiative randomized trials. *JAMA*. 2017;318(10):927-938.
- Stuenkel CA, Davis SR, Gompel A, et al. Treatment of symptoms of the menopause: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab*. 2015;100(11):3975-4011.
- American College of Obstetricians and Gynecologists. ACOG Practice Bulletin No. 141: Management of menopausal symptoms. *Obstet Gynecol*. 2014;123(1):202-216.
- Santen RJ, Stuenkel CA, Burger HG, Manson JE. Competency in menopause management: whither goest the internist? *J Womens Health (Larchmt)*. 2014;23(4):281-285.
- Cumming GP, Curie H, Morris E, Moncur R, Lee AJ. The need to do better — are we still letting our patients down and at what cost? *Post Reprod Health*. 2015;21(2):56-62.
- Hsieh E, Nunez-Smith M, Henrich JB. Needs and priorities in women's health training: perspectives from an internal medicine residency program. *J Womens Health (Larchmt)*. 2012;22(8):667-672.
- Casas RS, Hallett LD, Rich CA, Gerber MR, Battaglia TA. Program directors' perceptions of resident education in women's health: a national survey. *J Womens Health (Larchmt)*. 2017;26(2):133-140.
- Hess R, Chang CC, Conigliaro J, McNeil M. Understanding physicians' attitudes towards hormone therapy. *Womens Health Issues*. 2005;15(1):31-38.
- Christianson MS, Washington CI, Stewart KI, Shen W. Effectiveness of a 2-year menopause medicine curriculum for obstetrics and gynecology residents. *Menopause*. 2015;23(3):275-279.
- Newton KM, LaCroix AZ, Buist DS, Anderson LA, Delaney K. What factors account for hormone replacement therapy prescribing frequency? *Maturitas*. 2001;39(1):1-10.
- Faubion SS. *Mayo Clinic The Menopause Solution: A Doctor's Guide to: Relieving Hot Flashes, Enjoying Better Sex, Sleeping Well, Controlling Your Weight, and Being Happy*. New York, NY: Time Inc Books; 2016.
- Nonhormonal management of menopause-associated vasomotor symptoms: 2015 position statement of The North American Menopause Society. *Menopause*. 2015;22(11):1155-1172.

30. de Villiers TJ, Hall JE, Pinkerton JV, et al. Revised global consensus statement on menopausal hormone therapy. *Climacteric*. 2016;19(4):313-315.
31. Rocca WA, Gazzuola Rocca L, Smith CY, et al. Bilateral oophorectomy and accelerated aging: cause or effect? *J Gerontol A Biol Sci Med Sci*. 2017;72(9):1213-1217.
32. Shuster LT, Gostout BS, Grossardt BR, Rocca WA. Prophylactic oophorectomy in premenopausal women and long-term health — a review. *Menopause Int*. 2008;14(3):111-116.
33. Faubion SS, Kuhle CL, Shuster LT, Rocca WA. Long-term health consequences of premature or early menopause and considerations for management. *Climacteric*. 2015;18(4):483-491.
34. Parker WH, Feskanich D, Broder MS, et al. Long-term mortality associated with oophorectomy compared with ovarian conservation in the Nurses' Health Study. *Obstet Gynecol*. 2013;121(4):709-716.
35. Taylor HS, Kagan R, Altomare CJ, Cort S, Bushmakin AG, Abraham L. Knowledge of clinical trials regarding hormone therapy and likelihood of prescribing hormone therapy. *Menopause*. 2017;24(1):27-34.
36. Kaunitz AM, Manson JE. Management of menopausal symptoms. *Obstet Gynecol*. 2015;126(4):859-876.
37. Jiang X, Schnatz PF. Menopausal medicine: how to educate the next generation of menopause clinicians [editorial]. *Menopause*. 2013;20(11):1109-1110.
38. Freeman EW, Sammel MD, Lin H, et al. Symptoms associated with menopausal transition and reproductive hormones in midlife women. *Obstet Gynecol*. 2007;110(2, pt 1):230-240.
39. Dugan SA, Powell LH, Kravitz HM, Everson Rose SA, Karavolos K, Luborsky J. Musculoskeletal pain and menopausal status. *Clin J Pain*. 2006;22(4):325-331.
40. Baber R. Teaching the teachers [editorial]. *Climacteric*. 2017;20(6):503-504.
41. US Preventive Services Task Force. Clinical summary: hormone therapy in postmenopausal women: primary prevention of chronic conditions. US Preventive Services Task Force website, [https://www.uspreventiveservicestaskforce.org/Page/Document/ClinicalSummary\\_Final/menopausal-hormone-therapy-preventive-medication1](https://www.uspreventiveservicestaskforce.org/Page/Document/ClinicalSummary_Final/menopausal-hormone-therapy-preventive-medication1). Published December 2017. Accessed January 3, 2018.
42. Kling JM, Rose SH, Kransdorf LN, Viggiano TR, Miller VM. Evaluation of sex- and gender-based medicine training in postgraduate medical education: a cross-sectional survey study. *Biol Sex Differ*. 2016;7(suppl 1):38.
43. Momin M, Miloro M, Mercuri LG, Munaretto A, Markiewicz MR. Senior oral and maxillofacial surgery resident confidence in performing invasive temporomandibular joint procedures. *J Oral Maxillofac Surg*. 2017;75(10):2091.e1-2091.e10.
44. Mazzola CA, Lobel DA, Krishnamurthy S, Bloomgarden GM, Benzil DL. Efficacy of neurosurgery resident education in the new millennium: the 2008 Council of State Neurosurgical Societies post-residency survey results. *Neurosurgery*. 2010;67(2):225-232.
45. Daugherty SR, Baldwin DC Jr, Rowley BD. Learning, satisfaction, and mistreatment during medical internship: a national survey of working conditions. *JAMA*. 1998;279(15):1194-1199.