Original Article

Intrauterine Device Knowledge and Practices: A National Survey of Obstetrics and Gynecology Residents

Jennifer Tang, MD, MSCR, Rie Maurer, MA, and Deborah Bartz, MD, MPH

Objectives: The primary objective of this study was to assess the current intrauterine device (IUD) knowledge and counseling practices of US obstetrics and gynecology chief residents. The secondary objective was to evaluate the current IUD experience of obstetrics and gynecology residents.

Methods: A Web-based survey about IUD knowledge and practices was sent to US obstetrics and gynecology residents in January 2010. An analysis of responses by postgraduate year was completed using descriptive statistics.

Results: We received 699 surveys (36%) from a pool of 1922 residents in 96 different residency programs. A total of 654 respondents (94%) had placed an IUD during residency and 88% had received formal teaching about IUDs during residency. Only 53% of respondents knew that the copper IUD could be used for emergency contraception. Less than 65% of respondents would routinely recommend the IUD to adolescents or immediately after first trimester abortion.

Conclusions: Many US obstetrics and gynecology residents lack knowledge about IUD benefits and do not counsel all eligible women to use IUDs. We should continue to evaluate our training and educational programs to ensure that women's health providers do not act as a barrier to IUD use.

Key Words: intrauterine device, obstetrics and gynecology, resident education, survey

The modern intrauterine device (IUD) is highly reliable and cost-effective, making it the most common method of reversible contraception used worldwide.[1–3] Despite evidence that the IUD is safe,[4,5] women and their healthcare providers in the United States still report misconceptions about this method,[6–13] leading to IUD underutilization in this country.[14,15]

The low level of IUD uptake by American women has affected physician training and experience with the IUD. A survey of US obstetrics and gynecology chief residents was performed in 1992.[16] The survey was administered 6 months before graduation. It had a response rate of 68% and revealed that 38% of respondents had never placed an IUD, 71% had not placed more than 10 IUDs, and 26% had never received any formal didactic teaching about IUDs during their residency. Since that time, the percentage of US women using the IUD increased from 0.8% in 1995 to 5.5% in 2008[15]; however, women's healthcare providers continue to report poor IUD knowledge and use restrictive IUD eligibility criteria.[6–10,13,17] Given that the IUD has the highest 12-month continuation and satisfaction rates among reversible contraceptive methods, it is important to ensure that women who want to use the IUD are counseled appropriately and receive it when they are eligible and interested.[18]

Key Points

- Ninety-four percent of respondents had placed an intrauterine device (IUD), and 88% had received formal teaching about IUDs in residency.
- Many residents, however, still lacked knowledge about IUD benefits and did not counsel all eligible women to use IUDs.
- We should continue to evaluate our training and educational programs to ensure that women's healthcare providers do not continue to act as a barrier to IUD use.

From the Department of Obstetrics and Gynecology, University of North Carolina, Chapel Hill, and Center for Clinical Investigation and the Department of Obstetrics and Gynecology, Brigham and Women's Hospital, Boston, Massachusetts.

Reprint requests to Dr Jennifer H. Tang, Department of Obstetrics and Gynecology, University of North Carolina, Chapel Hill, 3031 Old Clinic Building, CB #7570, Chapel Hill, NC 27599-7570. Email: jennifer_tang@med.unc.edu

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In this study, our primary objective was to assess whether current US obstetrics and gynecology chief residents are learning evidence-based knowledge about the IUD and practicing up-to-date counseling methods concerning the IUD. The secondary objective was to evaluate the current level of IUD educational experience among obstetrics and gynecology residents.

Methods

This study is an analysis of a cross-sectional study of 699 obstetrics and gynecology residents. The study used a Web-based survey to assess the IUD knowledge and counseling practices of residents across all 4 years of training. Eligibility criteria included current enrollment in a US allopathic or osteopathic obstetrics and gynecology residency and willingness to participate in the study. The study was approved by the Partners HealthCare institutional review board.

To recruit residents, we asked either the residency coordinator or the residency program director of all US obstetrics and gynecology programs to forward a recruitment e-mail to residents in their program. Residency contact e-mail addresses were accessed through the Web sites of the Association of Professors of Gynecology and Obstetrics, the American Congress of Obstetricians and Gynecologists (ACOG), and the American College of Osteopathic Obstetricians and Gynecologists. If the contact information was out of date for a residency program, an Internet search was performed.

Each identified residency contact received the recruitment e-mail during the first week of January 2010. This e-mail outlined the study's purpose and procedures, invited the residents to participate, and included a hyperlink to the Web-based survey. Two reminder e-mails were sent to the residency contacts at the beginning of the third and fourth weeks of January 2010. The second reminder e-mail also requested that the residency contact reply to the primary study author with the following information: verification that the recruitment e-mail had been forwarded to the residents in their program and confirmation of how many residents were currently employed by their program. Study participation was closed 4 weeks after the initial recruitment e-mail was sent.

Study participation was anonymous and voluntary. Informed consent was implied when respondents read the e-mail description and completed the survey. The recruitment e-mails contained a request that respondents complete the survey only one time. Upon survey completion, respondents were given the option to participate in a raffle for one of five $200 gift cards. Respondents who completed the entire survey were given the hyperlink to a Web page with the answers to the survey questions.

The survey (Appendix, http://links.lww.com/SMJ/A16) was created via the SurveyMonkey software program (SurveyMonkey.com Palo Alto, CA). It was designed to take 10 to 15 minutes to complete and included 47 items: 5 demographic questions, 8 recall questions about prior IUD experience and family planning training, 20 questions to assess IUD knowledge, 13 clinical vignettes designed to assess practices for counseling candidates about the IUD, and 1 open-ended question asking "What more do you wish that you knew about the IUD?" Many survey items were used or modified with author permission from surveys previously used to assess IUD knowledge and practices in provider populations.[6,7]

The clinical practice vignettes represent a wide range of contraceptive counseling scenarios. The respondents were to answer the 13 practices questions by choosing one of the following responses: "recommend routinely," "recommend only if other options are unacceptable," "never recommend," or "not sure." The respondents were told that for each vignette "all other factors are favorable and there are no other contraindications

Table 1. Respondent characteristics and prior family planning experience (N = 699)

Characteristic	n (%)
Postgraduate year	
1	188 (26.9)
2	181 (25.9)
3	177 (25.3)
4	153 (21.9)
Sex	
Male	91 (13.0)
Female	608 (87.0)
Region	
Northeast/mid-Atlantic	245 (35.1)
Midwest	159 (22.7)
Southwest/southeast	156 (22.3)
West	139 (19.9)
Planned subspecialty	
Maternal fetal medicine	58 (8.3)
Reproductive endocrinology and infertility	41 (5.9)
Gynecologic oncology	46 (6.6)
Urogynecology	25 (3.6)
Family planning	37 (5.3)
Minimally invasive gynecologic surgery	29 (4.1)
Pediatric and adolescent gynecology	10 (1.4)
Other	9 (1.3)
None	388 (55.5)
Undecided	56 (8.0)
Completion of a family planning rotation during residency	
Have completed	193 (27.6)
Will complete	159 (22.7)
Will not complete because opted out	46 (6.6)
Will not complete because residency does not offer	301 (43.1)
Presence of a Kenneth J. Ryan Residency Training Program in Abortion and Family Planning	
>1 y	161 (23.0)
<1 y	28 (4.0)
None	364 (52.1)
Not sure	146 (20.9)

Table 2. Prior IUD experience by postgraduate year

IUD experience	Year 1 (N = 188), n (%)	Year 2 (N = 181), n (%)	Year 3 (N = 177), n (%)	Year 4 (N = 153), n (%)	Total (N = 699), n (%)
No. copper IUDs placed during residency					
0	117 (62.3)	55 (30.4)	27 (15.3)	13 (8.5)	212 (30.3)
1–2	54 (28.7)	58 (32.0)	30 (16.9)	24 (15.7)	166 (23.8)
3–5	13 (6.9)	38 (21.0)	51 (28.8)	30 (19.6)	132 (18.9)
6–10	3 (1.6)	19 (10.5)	27 (15.3)	38 (24.8)	87 (12.4)
≥11	1 (0.5)	11 (6.1)	42 (23.7)	28 (31.4)	102 (14.6)
No. levonorgestrel IUDs placed during residency					
0	47 (25.0)	8 (4.4)	1 (0.6)	4 (2.6)	60 (8.6)
1–2	37 (19.7)	15 (8.3)	9 (5.1)	1 (0.6)	62 (8.9)
3–5	56 (29.8)	22 (12.2)	14 (7.9)	9 (5.9)	101 (14.4)
6-10	28 (14.9)	44 (24.3)	2 (15.8)	11 (7.2)	111 (15.9)
≥11	20 (10.6)	92 (50.8)	125 (70.6)	128 (83.7)	365 (52.2)
No. didactic lectures on IUD					
0	48 (25.5)	19 (10.5)	12 (6.8)	4 (2.6)	83 (11.9)
1–3	132 (70.2)	141 (77.9)	121 (68.3)	86 (56.2)	480 (68.7)
≥4	8 (4.3)	21 (11.6)	44 (24.9)	63 (41.2)	136 (19.4)

IUD, intrauterine device.

for use of IUDs." The patient in each vignette was a category 1 or category 2 candidate for IUD placement by the World Health Organization Medical Eligibility Criteria[19]; therefore, if a respondent answered that he or she would "recommend routinely" an IUD to a patient, the respondent was considered to have answered the question correctly. The percentage of correct answers for each of the knowledge and practices questions was calculated.

Only the responses of resident respondents who completed the entire survey were analyzed. Descriptive statistics were used to analyze the respondents' demographic characteristics and family planning experiences. We contacted the American Medical Association to determine the proportion of obstetrics and gynecology residents in each postgraduate year in 2010. We also contacted the national office of the Kenneth J. Ryan Residency Training Program in Abortion and Family Planning to obtain the percentage of US obstetrics and gynecology residency programs with Ryan programs in 2010. We then used the χ^2 goodness of fit test and the one-proportion test, respectively, to assess whether the survey respondents were proportionally representative of US obstetrics and gynecology residency programs by postgraduate year and presence of a Ryan program. All of the statistical tests were performed using SAS 9.2 (SAS Institute, Cary, NC).

Results

We obtained residency contact e-mail addresses for 258 (96%) of the 270 US obstetrics and gynecology programs that we identified in December 2009 (we were unable to obtain correct e-mail addresses for the remaining 12 programs). We received confirmation from 96 of the 258 residency contacts that the recruitment e-mail had been forwarded to the residents in their program. These 96 programs represented 1922 residents from 34 different states. A total of 699 residents completed the entire survey, for a response rate of 36%.

Residents from all 4 years of training participated in the survey (Table 1). The distribution of the respondents by postgraduate year was not significantly different from the distribution of residents in the 2010 American Medical Association data ($\chi^2_3 = 2.05$; $P = 0.562$). Residents from across the United States participated in the survey; the majority (56%) did not plan to specialize. Almost half (43%) reported that their residency did not have a formal family planning rotation. Twenty-seven percent reported that their residency had a Ryan program, which was not significantly different (one-proportion test; $P = 0.885$) from the national office figure of 30%.

A total of 654 respondents (94%) had placed an IUD during their residency. Thirty percent of respondents had never placed a copper IUD during residency, whereas only 9% had never placed a levonorgestrel IUD (Table 2). All of the chief residents had placed at least one IUD during their residency, although 9% had never placed a copper IUD and 3% had never placed a levonorgestrel IUD. Nine of the 153 chief resident respondents (6%) had placed ≤10 total IUDs (data not shown). Twelve percent of respondents had never attended a didactic lecture on the IUD, including 3% of chief resident respondents.

For most of the 20 knowledge questions, a greater proportion of residents in postgraduate years 3 and 4 responded with the correct answer when compared with residents in postgraduate years 1 and 2 (Table 3). Overall, respondents were least likely

Table 3. Number and percentage of correct answers for 20 knowledge questions by postgraduate year

Knowledge questions	Year 1 (N = 188), n (%)	Year 2 (N = 181), n (%)	Year 3 (N = 177), n (%)	Year 4 (N = 153), n (%)	Total (N = 699), n (%)
1-year IUD failure rate	165 (87.8)	163 (90.1)	155 (87.6)	139 (90.9)	622 (89.0)
Maximum years of use for copper IUD	182 (96.8)	180 (99.5)	176 (99.4)	152 (99.4)	690 (98.7)
Maximum years for levonorgestrol IUD	183 (97.3)	178 (98.3)	174 (98.3)	148 (99.4)	683 (97.7)
Return to fertility	134 (71.3)	143 (79.0)	148 (83.6)	124 (81.0)	549 (78.5)
Discontinuation rate	137 (72.9)	146 (80.7)	141 (79.7)	129 (84.3)	553 (79.1)
Expulsion rate	181 (96.3)	172 (95.0)	172 (97.2)	145 (94.8)	670 (95.9)
Emergency contraception	80 (42.6)	89 (49.2)	111 (62.7)	92 (60.1)	372 (53.2)
Mechanism of action	160 (85.1)	157 (86.7)	152 (85.9)	140 (91.5)	609 (87.1)
Ectopic pregnancy risk	133 (70.7)	130 (71.8)	138 (78.0)	114 (74.5)	515 (73.7)
Pelvic inflammatory disease risk after 20 d	98 (52.1)	90 (49.7)	95 (53.7)	79 (51.6)	362 (51.8)
Antibiotic use before insertion	167 (88.8)	172 (95.0)	176 (99.4)	150 (98.0)	665 (95.1)
Cervical culture results before routine insertion	85 (45.2)	104 (57.5)	112 (63.3)	216 (71.2)	410 (58.7)
Wait until next menses before routine insertion	109 (58.0)	125 (69.1)	131 (74.0)	117 (76.5)	482 (68.9)
Noncontraceptive benefits of the levonorgestrel IUD					
Improvement of bleeding from menorrhagia	177 (94.1)	175 (96.7)	166 (93.8)	145 (94.7)	663 (90.6)
Improvement of pain from endometriosis	97 (51.6)	100 (55.2)	103 (58.2)	88 (57.5)	388 (55.5)
Improvement of bleeding and pain from adenomyosis	90 (47.9)	94 (51.9)	108 (61.0)	93 (60.8)	385 (55.1)
No improvement of bulk symptoms from fibroids	164 (87.2)	150 (82.9)	154 (87.0)	136 (88.9)	604 (86.4)
No improvement of pain from ovarian cysts	148 (78.7)	147 (81.2)	145 (81.9)	134 (87.6)	574 (82.1)
Endometrial hyperplasia and cancer protection	110 (58.5)	129 (71.3)	143 (80.8)	155 (81.0)	506 (72.4)
No breast cancer protection	179 (95.2)	174 (96.1)	172 (97.2)	150 (98.0)	675 (96.6)

IUD, intrauterine device.

(52%) to correctly answer the question "Does inserting an IUD increase a patient's risk of pelvic infection during the first 20 days after insertion?," which may have resulted from misinterpretation of the question. Only 53% correctly responded with "copper IUD" as the answer for the question "Which IUD(s) is/are FDA [Food and Drug Administration] approved to be used as emergency contraception to prevent unintended pregnancy if placed within 5 days of unprotected intercourse?" Among the questions regarding the noncontraceptive benefits of the levonorgestrel IUD, only 55% of respondents knew that it could lead to "improvement of pain from endometriosis" and "improvement of pain and bleeding from adenomyosis," and 72% knew that it could offer protection from endometrial hyperplasia and cancer.

For the 13 counseling practices questions, residents from postgraduate years 3 and 4 were, in general, more likely than residents in postgraduate years 1 and 2 to "recommend routinely" the IUD to patients in the vignettes (Table 4). Respondents were least likely (20%) to "recommend routinely" the IUD immediately postpartum (<48 hours) after delivery of the placenta. Even when the responses were expanded to include "recommend only if other options are unacceptable," only 44% would ever recommend immediate postpartum IUD insertion (data not shown). Sixty-one percent of respondents would routinely recommend the IUD to patients in the following categories: younger than 20 years old, immediately after a first trimester abortion, and more than one sexual partner. Fewer than 75% of respondents would "recommend routinely" the IUD to patients with a history of pelvic inflammatory disease >3 months ago (50%), a history of ectopic pregnancy (72%), and human immunodeficiency virus well controlled on antiretrovirals (72%). Among residents in all postgraduate years, <80% would routinely recommend the IUD to nulliparous patients.

Discussion

The 2009 Council on Resident Education in Obstetrics and Gynecology (CREOG) Educational Objectives for Residency Programs state that all obstetrics and gynecology residents should learn to "describe the advantages, disadvantages,

Table 4. Number and percentage of correct answers for 13 counseling practices questions by postgraduate year

Counseling practices questions*	Year 1 (N = 188) n (%)	Year 2 (N = 181) n (%)	Year 3 (N = 177) n (%)	Year 4 (N = 153) n (%)	Total (N = 699) n (%)
A patient who has never been pregnant	115 (61.2)	129 (71.3)	131 (74.0)	119 (77.8)	494 (70.7)
A patient who has had no deliveries	122 (64.9)	137 (75.7)	139 (78.5)	128 (84.2)	526 (75.4)
Patient who has had ≥1 deliveries	182 (96.8)	179 (98.9)	174 (98.3)	149 (97.4)	684 (97.9)
Immediately after a first trimester abortion	96 (51.3)	109 (61.2)	109 (61.6)	109 (72.7)	423 (61.1)
Immediately postpartum (<48 h) after delivery of placenta	38 (20.2)	33 (18.2)	37 (21.1)	33 (21.6)	141 (20.2)
A patient <20 years old	104 (55.9)	109 (60.2)	109 (62.3)	103 (67.8)	425 (61.2)
A patient who has 1 sexual partner	177 (94.2)	174 (96.7)	171 (97.2)	149 (97.4)	671 (96.3)
A patient who has >1 sexual partner	106 (56.4)	115 (63.5)	114 (64.8)	92 (60.1)	427 (61.2)
Patient with history of ectopic pregnancy	115 (61.5)	132 (73.3)	129 (73.7)	121 (79.6)	497 (71.6)
Patient with history of STI that has been treated	138 (73.8)	140 (78.2)	144 (81.8)	129 (84.3)	551 (79.3)
Patient with history of PID >3 mo ago	77 (41.6)	87 (48.1)	96 (54.6)	86 (56.2)	346 (49.8)
Patient with HIV that is well controlled on antiretrovirals	116 (62.7)	127 (70.2)	132 (74.6)	126 (82.4)	501 (72.0)
Patient with a history of DVT or pulmonary embolism	133 (71.1)	158 (87.3)	149 (84.2)	140 (91.5)	580 (83.1)

DVT, deep vein thrombosis; HIV, human immunodeficiency virus; IUD, intrauterine device; PID, pelvic inflammatory disease; STI, sexually transmitted infection.
** The respondents were told that for each vignette "all other factors are favorable and there are no other contraindications for use of IUDs." Because the patient in each vignette is a category 1 or category 2 candidate for IUD placement by World Health Organization Medical Eligibility Criteria, if a respondent answered that he or she would "recommend routinely" an IUD to a patient, the respondent was considered to have answered the question correctly.*

failure rates, mechanisms of action and complications" associated with the IUD.[20] This study demonstrates that many deficiencies in IUD knowledge and counseling practices still exist. Many residents do not know about the noncontraceptive benefits of the levonorgestrel IUD or that the Copper T380A IUD can be used as an emergency contraceptive. They also are not routinely recommending the IUD to all eligible patients.

Previous surveys on IUDs revealed that women's healthcare providers are particularly hesitant to place IUDs in nulliparous women and women with a history of sexually transmitted infections.[6,8,13] One of the surveys also showed that providers were uncomfortable placing IUDs immediately postpartum, immediately postabortion, in adolescents, in women with a history of ectopic pregnancy, and in women who were positive for the human immunodeficiency virus, even though all of these groups may be at high risk for unintended pregnancy. The resident respondents in this survey also were less likely to routinely recommend an IUD to women in these groups.

The greatest limitations of this study are the low response rate and the potential for selection bias. Residents with less IUD experience and knowledge may have been less likely than residents with more IUD experience and knowledge to receive the recruitment e-mail and complete the survey. One residency coordinator replied that she did not forward the recruitment e-mail because the residency was located at a Catholic hospital and the residents there did not "practice birth control or any intrauterine devices." This response also supports results from another study that found that clinicians who trained at Catholic institutions were less likely to receive training in IUD insertion than clinicians who trained at secular institutions.[9] We suspect that the low response rate is the result of the short duration of the study and our strategy of e-mail recruitment for an electronic survey. Other recent electronic surveys targeted at obstetrics and gynecology residents have had similarly low response rates.[21,22] A solution to increase the response rate would be to offer a paper survey about IUD knowledge and training as a pretest to the annual CREOG examination for all obstetrics and gynecology residents. These pre-CREOG examination tests, which have focused on topics such as fetal ultrasound training and reproductive endocrinology and infertility knowledge, have had resident response rates ranging from 96% to 98%.[23,24]

Another limitation is that resident practices may be affected by external factors. For example, residents may be hesitant to routinely recommend IUDs immediately postpartum because their hospitals would not receive reimbursement for inpatient IUD placement. In addition, the clinics where residents train may have protocols that they must follow even if they do not agree with them. We addressed this concern by asking respondents what they would do in their own future practices rather than what they did during residency; however, financial considerations or other barriers still may have affected their responses.

Since January 2010, considerable effort has been directed toward improving the IUD knowledge and counseling practices

of US medical practitioners. In June 2010, the Centers for Disease Control and Prevention published the US Medical Eligibility Criteria for Contraceptive Use as a guide for practitioners.[25] In 2011, ACOG published a Practice Bulletin encouraging use of the US Medical Eligibility Criteria.[26] ACOG also has published a number of Practice Bulletins and Committee Opinions that advocate for increased use of the IUD and educate about its noncontraceptive benefits.[27–29] If this survey were repeated today, the responses could be significantly improved. Furthermore, trials are under way for two levonorgestrel IUDs that are thought to be more suitable for nulliparous women and parous women with a smaller endometrial cavity.[30] Once these IUDs are put on the market, greater awareness and acceptability for placing IUDs in nulliparous women may follow.

Conclusions

Although this study is limited by a nonrandom and relatively low sample size, its results are important because it revealed that even those residents who were most likely to have experience with IUDs had deficiencies in their IUD knowledge and counseling practices. We need to improve our residency curricula about the IUD so that providers do not act as a barrier to IUD uptake. We can include more evidence-based lectures about IUDs and evaluate if primary care residents are being taught up-to-date IUD counseling practices. We can encourage women's healthcare providers to read publications by the Centers for Disease Control and ACOG that address the best practices for the IUD. Finally, we can support family practice and obstetrics and gynecology residencies to include family planning rotations and increase the number of Ryan programs. It is hoped that this study will prompt US residency programs to assess their IUD curricula and ensure that this safe and effective contraceptive is offered to all eligible women.

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