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Counseling and provision of long-acting reversible contraception in the US: National survey of nurse practitioners

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Abstract

Objective—Nurse practitioners (NPs) provide frontline care in women's health, including contraception, an essential preventive service. Their importance for contraceptive care will grow, with healthcare reforms focused on affordable primary care. This study assessed practice and training needs to prepare NPs to offer high-efficacy contraceptives - IUDs and implants.

Method—A US nationally representative sample of nurse practitioners in primary care and women's health was surveyed in 2009 (response rate 69%, n=586) to assess clinician knowledge and practices, guided by the CDC US Medical Eligibility Criteria for Contraceptive Use.

Results—Two-thirds of women's health NPs (66%) were trained in IUD insertions, compared to 12% of primary care NPs. Contraceptive counseling that routinely included IUDs was low overall (43%). Nurse practitioners used overly restrictive patient eligibility criteria, inconsistent with CDC guidelines. Insertion training (aOR=2.4, 95%CI: 1.10 5.33) and knowledge of patient eligibility (aOR=2.9, 95%CI: 1.91 4.32) were associated with IUD provision. Contraceptive implant provision was low: 42% of NPs in women's health and 10% in primary care. Half of NPs desired training in these methods.

Conclusion—Nurse practitioners have an increasingly important position in addressing high unintended pregnancy in the U.S., but require specific training in long-acting reversible contraceptives.

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Keywords

Nurse practitioners; contraceptive care; IUD; contraceptive implant; long-acting reversible contraception

Introduction

Nurse Practitioners (NP) are important providers of women's preventive care, especially in publicly-funded clinics serving populations at highest risk of unintended pregnancy.(Landry et al., 2008) Unintended pregnancy has persisted as a public health challenge in the United States, with significant economic and health-related costs.(Finer and Zolna, 2011; Sonfield et al., 2011) The role of nurse practitioners in contraceptive care stands to expand, with the inclusion of contraceptives and counseling as essential preventive care to be covered by insurance plans under the Affordable Care Act.(Institute of Medicine, 2011) Up-front costs have been a barrier for women to access contraceptives with the highest efficacy, the IUD and contraceptive implant, or long-acting reversible contraceptives (LARC).(Harper et al., 2012) Use of these methods has been greater in states where women have coverage for contraceptives, such as insurance mandates and Medicaid family planning expansion programs.(Thompson et al., 2011) Now that contraceptive coverage is expanding across the country, more women will be able to access these methods. The Centers for Disease Control and Prevention (CDC) points to the importance of increasing access to LARC methods to reach the Healthy People 2020 objective of reduced unintended pregnancy.(Centers for Disease Control and Prevention, 2013b; US Department of Health and Human Services, 2012)

While almost all contraceptive providers currently offer women oral contraceptives and condoms,(Landry et al., 2008) these methods have high discontinuation and typical-use failure rates, especially among underserved populations, where failure of oral contraceptives can be as high as 16 pregnancies per 100 person-years.(Kost et al., 2008; Raine et al., 2011; Vaughan et al., 2008) LARC methods have extremely low typical use failure rates (< 1%), similar to perfect use failure rates from clinical trials, because the methods require no user action for effectiveness.(Trussell, 2011) Many contraceptive providers have inadequate education on LARC methods.(Dehlendorf et al., 2010; Harper et al., 2008; Harper et al., 2012) LARC method use is low in the U.S., compared to some European countries, (U.S. 5%, France 23%, Finland 26%, Norway 27%) where health systems are focused on preventive and primary care.(Mosher and Jones, 2010; United Nations Department of Economic and Social Affairs Population Division, 2011) We are not aware of prior research that has examined the nursing profession to assess contraceptive care practices of NPs trained in women's health and in primary care, particularly for the high-efficacy methods. In primary care, patients are seen for a wide range of medical issues, and there are competing demands on provider time. However, primary care NPs, as well as specialists in women's health, will be called upon for women's preventive health needs in our national context of improved contraceptive coverage and access.(Cleland et al., 2011; Pace and Cohen, 2011)

This study uses nationally representative survey data to identify counseling and provision practices for LARC methods among nurse practitioners serving women of reproductive age. Nationally representative data can help to reveal the prevalence of evidence-based contraceptive care among nurse practitioners and whether LARC is routinely provided in clinical practice. Study results can be used to help inform training and programmatic efforts to prepare our primary healthcare workforce to address the epidemic of unintended pregnancy. Our hypothesis is that LARC-specific, evidence-based education is required for

nurse practitioners to integrate these high-efficacy methods into standard contraceptive care in the US.

Methods

We conducted a national probability survey of nurse practitioners (NPs) specializing in women's health and primary care in 2009. The study was approved by the University of California, San Francisco Committee on Human Research. Our aim was for a sample size of at least 500 eligible respondents to achieve population estimates with $\pm 5\%$ precision. For a detailed description of methodology, see Henderson *et al.* 2010.(Henderson et al., 2010) We used the Verispan national database of nurse practitioners, a comprehensive database updated monthly. Stratified probability samples of 600 primary care NPs and 600 women's health NPs were drawn, using a random number generator. Duplicate names were dropped and 1,179 unique surveys were mailed. Primary care NPs were defined as NPs who worked in family medicine, primary care and adult medicine. Women's health NPs were working in obstetrics and gynecology, women's health, and reproductive medicine/family planning. To be eligible, NPs had to spend most of their time in direct patient care and provide family planning or HIV/STI services. There were 586 eligible respondents, and 221 ineligible NPs (or 27.4% of the total). Among the 372 non-responders, we assumed that the proportion ineligible was similar (27.4%; n=102), and removed all ineligibles (n=323) from the response rate denominator of 1,179.(The American Association for the Public Opinion Research, 2009) The response rate was 69%.

We sent selected NPs a letter explaining the study, followed by a survey, cover letter, return envelope and \$20 cash by U.S. Priority Mail. A reminder postcard was sent one week later, and another survey to non-respondents in three weeks. Research staff made a maximum of four reminder calls.

The survey instrument was developed through formative qualitative interviews with clinicians, and items validated in previous research.(Harper et al., 2008; Harper et al., 2010b; Henderson et al., 2011) Survey items covered clinician characteristics, professional training, practice factors, patient population, and contraceptive care. Measures on LARC methods included clinician insertion skills, perceptions of safety, and beliefs of patient interest. Survey items included clinician knowledge of patient eligibility and method indications. Clinicians were also asked whether they would like training in IUDs or contraceptive implants.

Outcome Measures: Counseling and Provision of IUDs

Nurse practitioners were asked about the frequency of counseling female contraceptive patients on IUDs, using a 4-point likert scale (always, usually, sometimes, never). We created a dichotomous variable for routine counseling (usually/always v. sometimes/never). For contraceptive provision, the survey asked which methods were currently offered, and included the levonorgestrel-releasing IUD (Mirena[®]), the copper IUD (ParaGard[®]). We combined the two IUDs into a dichotomous outcome variable of IUD provision (yes/no).

The main predictor variable was professional training (primary care or women's health). We also assessed practicum training in IUD insertion (yes/no). We evaluated clinician knowledge of method indications for the copper IUD and the levonorgestrel-releasing system, based on the CDC *U.S. Medical Eligibility Criteria for Contraceptive Use*.(Centers for Disease Control and Prevention, 2010) We created scale variables measuring knowledge and attitudes, based on previous research.(Harper et al., 2008; Harper et al., 2012) The knowledge variable had a reliability coefficient of 0.95. For knowledge, clinicians were asked whether they considered women with the following medical conditions to be eligible

for the copper IUD: fibroids without distortion of uterine cavity, diabetes, obesity, smoker, history of hypertension. We used the same list of eligible conditions for the levonorgestrel-releasing system, as well as menorrhagia, dysmenorrhea, and iron deficiency anemia. NPs who responded that they would consider a woman for IUD use with these conditions were considered to have more evidence-based views of eligible women. We also created a 6-item scale variable to measure risk perceptions on how often clinician concerns about certain medical issues would prevent him/her from recommending IUDs: Uterine perforation at insertion, expulsion, sexually transmitted infections (STIs), pelvic inflammatory disease (PID), infertility, bleeding pattern changes. Responses (never, sometimes, usually, always) were reverse-coded for scale construction of low risk perception. The scale reliability coefficient on perception of risk was 0.84.

Statistical Analysis

We presented frequencies by specialty, and estimated odds ratios through bivariate and multivariable analyses, with 95% confidence intervals. We applied stratification design specifications in analyses to account for disproportionate sampling of NPs by specialty. The design-based Pearson Chi-square test for overall categorical differences and the Wald test for mean differences were calculated. We conducted multivariable logistic regression analysis to estimate the variation in each outcome variable, routine counseling and provision of IUDs, with clinician factors, evidence-based knowledge, and attitudes. We controlled for practice setting factors, including location and provider type (hospital-based, private office, community or family planning clinic). Significance was reported at $p < 0.05$. Stata 11.1 (Stata Corp., College Station, TX) was used for analyses.

Results

A total of 586 eligible nurse practitioners responded, including 224 in primary care and 360 in women's health (Table 1). Most of the NPs (86%) were trained in family planning, including almost all working in women's health (97%). All of the NPs surveyed saw female patients in need of contraception, but women's health NPs saw on average more than three times as many contraceptive patients per week as primary care NPs ($p < 0.001$).

IUD insertion skills were limited among primary care NPs; only 12% reported they were comfortable inserting IUDs, although 92% believed IUDs to be a safe. However, 72% of NPs in women's health were comfortable inserting IUDs, with 98% believing the method to be safe. Compared to women's health NPs, those in primary care were unlikely to have received clinical IUD insertion practicum training (66% v. 12%). Training and skills in the contraceptive implant were also low, with 26% of women's health NPs competent in insertions and only 6% of primary care nurses.

Over three-quarters of NPs thought they had sufficient time to counsel their patients on contraceptive options, and most (89%) reported that their patients would be receptive to learning about IUDs. Most NPs (73%) believed IUDs were under-used in their patient population, with no difference by specialty. However, only 30% of primary care NPs and 72% in women's health reported routinely including IUDs in discussions with contraceptive patients. About 60% of NPs considered cost of LARC methods an important obstacle to provision.

While oral contraceptives were provided by 97% of women's health NPs and 83% of primary care NPs, IUDs were offered far more frequently by women's health NPs than primary care NPs (86% v. 31%). The contraceptive implant was offered by only 42% of women's health NPs and 10% of primary care NPs.

Fifty percent of women's health NPs desired training in the contraceptive implant, as did 30% of primary care NPs. Twenty percent of women's health NPs and 35% in primary care desired IUD training. Overall, half of NPs desired training in LARC methods with no significant difference by specialty.

Many NPs were not aware of the wide range of women eligible for IUD use, according to the *CDC Medical Eligibility Criteria for Contraception*, including teenagers and nulliparous women. Only 29% of NPs in primary care and 51% in women's health thought teenagers were eligible. In general, primary care NPs had lower knowledge about patient eligibility for IUDs than did women's health NPs (see Figure 1).

Table 2 shows IUD knowledge and risk perceptions among NPs, by specialty. NPs working in women's health had more accurate knowledge of method contraindications, but few NPs in primary care knew that IUDs are appropriate for women with common conditions, including diabetes, obesity, or smoking. Few NPs in primary care were aware of the non-contraceptive benefits of levonorgestrel-releasing IUDs, including improvement in menorrhagia and dysmenorrhea. Primary care NPs' lower knowledge of method contraindications was accompanied by higher perceptions of risks associated with IUDs, particularly concerns about STIs, PID and infertility.

Results from multivariable logistic regression (Table 3) showed that primary care NPs were significantly less likely to routinely counsel contraceptive patients on IUDs compared to women's health NPs (aOR=.41, 95%CI: 0.23 0.72). However, NPs with a high level of knowledge were almost twice as likely to routinely counsel patients (OR=1.9, 95%CI: 1.35 2.80). Results in Table 4 show that primary care NPs had significantly lower odds of IUD provision (OR=0.19, 95%CI: 0.10 0.38). Practicum training for insertions was associated with greater provision later in practice (OR=2.4, 95%CI: 1.10 5.33). Attitudes and knowledge were also associated with IUD provision: NPs with low perception of IUD risks had increased odds of provision (OR=1.5, 95%CI 1.00 2.19), as did those with a high level of IUD knowledge (OR=2.9, 95%CI: 1.91 4.32).

Discussion

Nurse practitioners serve millions of contraceptive patients, and are trained to have skills in counseling and clinical care. The clinic visit is especially important for patient education and counseling on LARC methods. Few U.S. women are familiar with LARC methods, especially younger women at high risk of unintended pregnancy.(Kaye et al., 2009; Whitaker et al., 2008) National survey data have shown that young women consider their healthcare providers their most trusted source of contraceptive information.(Kaye et al., 2009) Young women are also more likely to choose a new method, including the IUD, if their provider has discussed it with them.(Fleming et al., 2010; Harper et al., 2010a) While LARC method used has increased recently in the U.S., most of the increase is among parous women.(Finer et al., 2012; Kavanaugh et al., 2011) Although young women relying on user-dependent methods have elevated failure and pregnancy rates,(Raine et al., 2011) these results showed that NPs often do not view adolescent and nulliparous women as IUD candidates, due to overly restrictive views of eligibility.(Centers for Disease Control and Prevention, 2010; Deans and Grimes, 2009) Integrating long-acting contraception into NPs' counseling and clinical practice can help to prevent pregnancy and also rapid subsequent pregnancy among adolescent mothers and young women.(Waggoner et al., 2012)

Results showed that women with common conditions seen in the primary care setting, including history of hypertension, obesity, and diabetes, are often viewed as ineligible for IUD use. Offering high-efficacy methods to a wide range of women, including those with

medical problems, is particularly important as these women are more likely to have complicated pregnancies. Furthermore, estrogen-containing methods, such as the combined oral contraceptive pill, are associated with a small increased risk for women with risk factors for cardiovascular disease, such as hypertension, obesity and diabetes (Burkman R et al., 2011). The NPs surveyed offered oral contraceptives almost universally, but were far less likely to offer the IUD or implant, high-efficacy methods without estrogen. It is important for clinicians to offer these methods to increase safe and effective pregnancy prevention for women with medical conditions.

While primary care NPs have general family planning training, these data showed that training to competency in IUDs or implants was rare, but widely desired by NPs working in primary care as well as in women's health. Almost all NPs considered IUDs to be safe, but less than half reported routinely counseling women. Results on attitudes showed while general attitudes about safety were high, NPs in primary care also held relatively high risk perceptions of the IUD in specific areas, for example, PID and infertility. However, risk perceptions were lower among NPs with higher knowledge, and the lower risk perceptions were also associated with higher provision. Qualitative data have also shown this inverse relationship, and that risk perceptions tend to decrease with greater familiarity and experience. (Morse et al., 2012) Core training during advanced practice nursing programs is needed. Curriculums should be revised to include these methods in core training. Continuing education for practicing NPs is critical as well, particularly as contraceptive technologies advance and new methods, such as the single-rod implant, become available. Resources should be given for hands-on training in continuing education. The training must include didactics on method indications and appropriate patient eligibility criteria, in order for NPs to be able to offer evidence-based counseling to patients. The CDC US Medical Eligibility Criteria for Contraceptive Use, (Centers for Disease Control and Prevention, 2010) as well as the newly released US Selected Practice Recommendations for Contraceptive Use (Centers for Disease Control and Prevention, 2013a), are important sources for evidence-based training. In this study evidence-based views of IUDs accompanied greater counseling and provision of the method.

According to diffusion of innovation theory, significant investment is needed early on for new clinical practices to be disseminated, or change falters. (Berwick, 2003) These results show that among primary care NPs significant investments will be needed for evidence-based information on LARC methods to become part of standard contraceptive care. However, for NPs in women's health, supplementary educational efforts should be able to achieve more widespread access to LARC methods.

Strengths of this study include nationally representative data assessing provision of the most effective contraceptive methods, and a relatively high response rate for national surveys of clinicians. (Lawrence and Curlin, 2009; U.S. Department of Health and Human Services and Health Resources and Services Administration (2010)) All analyses show association, rather than causation. A limitation is that we asked the NPs themselves about their practices, and responses may have social desirability bias. However, bias would likely mean training needs would only be more pronounced; data on provision may be more objective. When the survey was planned, the implant was available in few practices, so survey questions were more heavily concentrated on the IUD. It is possible that LARC competence among NPs has increased since data collection. As a nationally representative survey, these results can stand as an important baseline upon which we can compare any improvements in LARC competency over time, among primary care and women's health NPs. Similar findings, of limited implant training and low counseling of young women on IUDs, was also found in a 2011 survey of publicly funded family planning clinics in the U.S. (Kavanaugh et al., 2013)

Conclusions

A shift in the current paradigm towards a greater emphasis on prevention and evidence-based care may hold promise to achieve Healthy People 2020 goals. (Levi and Dau, 2011; Taylor and James, 2011) NPs provide important care to underserved patient populations, and can make a difference in our nation's health. (Grumbach et al., 2003; Kuehn, 2010) NPs offer care to vulnerable women of reproductive age in primary care settings, such as Federally Qualified Health Centers, as well as in community family planning clinics. To address the persistent problem of unintended pregnancy, it is essential to train nurse practitioners who deliver contraceptive care to offer the most effective methods, alongside more familiar methods.

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Conflict of Interest Statement

Dr. Raine-Bennett and Dr. Cynthia Harper have received grant support for research on emergency contraception from Teva Pharmaceuticals Inc, administered through the University of California, San Francisco. Ms. Debbie Postlethwaite is using research funds provided by Bayer HealthCare Pharmaceutical Inc. for a study, administered through the Kaiser Foundation Research Institute. Dr. J. Joseph Speidel serves as a consultant to Medicines360, WomanCare Global and Bayer Healthcare Pharmaceutical Inc.

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Highlights

- Contraceptives are now included as women's essential preventive care.
- With emphasis on affordable primary care, NPs are prominent in contraceptive care.
- Counseling on IUDs and implants is not yet a part of standard contraceptive care.
- Evidence-based training was rare, but desired, for primary care nurse practitioners.
- Education based on CDC US Medical Eligibility Criteria for Contraception is needed.

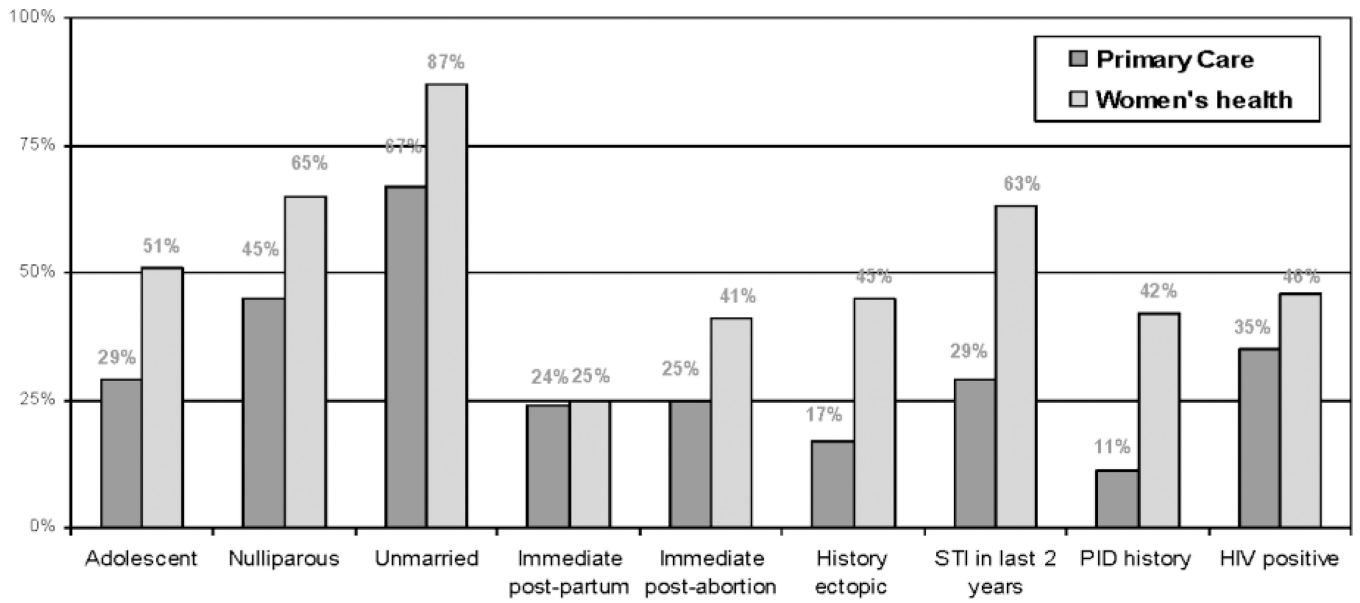


Figure 1. Percentage of advance practice nurses who would consider Intrauterine contraception for the following patients

Table 1

US Nurse Practitioner Characteristics and Contraception Practices

	Women's Health NPs (n=363)	Primary Care NPs (n=223)	Total N=586
Clinician Characteristics			
Age, mean years (sd)**	51 (9.8)	49 (9.8)	50 (9.9)
Gender, n (%)			
Male	3 (0.8)	12 (5)	15 (4)
Female	360 (99)	211 (95)	571 (96)
Race/ethnicity, n (%)			
White	313 (87)	198 (89)	511 (88)
African-American	20 (6)	14 (6)	34 (6)
Hispanic/Latino	10 (3)	6 (3)	16 (3)
Asian/Pacific Islander	9 (3)	2 (1)	11 (1)
Multi-racial/other	6 (2)	3 (1)	9 (1)
Practice Setting & Patient Population			
Practice setting, n (%)**			
Private office	154 (42)	124 (56)	278 (52)
Community clinic	131 (36)	50 (23)	181 (27)
Hospital-based practice	78 (21)	46 (21)	124 (21)
Urban v. rural, n (%)**	284 (79)	150 (68)	434 (71)
Region, n (%)***			
West	112 (30)	32 (14)	144 (19)
Midwest	66 (18)	40 (18)	106 (18)
Northeast	62 (17)	50 (22)	112 (21)
South	123 (34)	101 (45)	224 (42)
Contraceptive patients per week, mean (sd)***	30 (30)	9 (13)	22 (27)
Training			
Trained in family planning, n (%)***	353 (97)	181 (82)	583 (86)
Inserted IUC in clinical practicum, n (%)***	237 (66)	27 (13)	264 (29)
Comfortable inserting IUD, n (%)***	232 (73)	25 (12)	257 (30)
Comfortable inserting single-rod implant, n (%)***	90 (26)	12 (6)	102 (12)
Contraceptive Counseling			
Time to counsel patients on contraceptives, n (%)**	302 (84)	159 (74)	461 (77)
Patients receptive to learning about IUD, n (%)***	338 (95)	180 (86)	518 (89)
Routinely discuss IUD with patients, n (%)***	260 (72)	64 (30)	324 (43)
Contraceptives Provided to Patients			
Oral contraceptive pills, n (%)***	351 (97)	182 (84)	533 (88)
Vaginal ring, n (%)***	321 (88)	132 (61)	453 (69)

	Women's Health NPs (n=363)	Primary Care NPs (n=223)	Total N=586
Transdermal patch, n(%) ^{***}	290 (80)	120 (55)	410 (63)
Injectable, n (%) ^{***}	337 (93)	155 (71)	492 (78)
Emergency contraceptive pills, n (%) ^{***}	310 (85)	111 (51)	421 (61)
IUDs, n (%) ^{***}	311 (86)	67 (31)	378 (48)
Implant, n (%) ^{***}	154 (42)	21 (10)	175 (20)

*
p 0.05

*
p 0.010

*
p 0.001

Table 2

Knowledge and Attitudes on Intrauterine Contraception among Nurse Practitioners in the United States

	Women's health NPs %	Primary care NPs %	Total %
Nurse practitioner knowledge of appropriate IUC use			
<i>Would consider LNG-IUS for patients with^Y:</i>			
Diabetes ^{***}	81	39	52
Obesity ^{***}	85	42	56
Smoker ^{***}	84	36	51
History of Hypertension ^{***}	84	38	53
Fibroids without distortion uterine cavity ^{***}	74	31	44
<i>Would consider copper IUD for patient with^Y:</i>			
Diabetes ^{***}	82	40	54
Obesity ^{***}	86	43	57
Smoker ^{***}	92	47	61
History of hypertension ^{***}	91	48	62
Fibroids without distortion uterine cavity ^{***}	53	25	34
Nurses practitioner attitudes (perception of risk)			
<i>Concerns about the following issues would prevent IUD recommendation:</i>			
Sexually transmitted infections ^{**}	35	49	44
Pelvic inflammatory disease ^{***}	38	55	50
Infertility ^{***}	15	27	23
Expulsion ^{***}	4	14	11
Uterine perforation at insertion ^{***}	5	19	15
Changes in bleeding pattern ^{***}	11	26	21

^YAll conditions approved for method use by *CDC Medical Eligibility Criteria for Contraception*

* p 0.05

** p 0.01

*** p 0.001

LNG, levonorgestrel-releasing intrauterine system

Table 3

Routine Counseling on Intrauterine Contraceptives to Female Contraceptive Patients: Multivariable Logistic Regression Results of US Nurse Practitioners

Routinely counsel patients on IUDs	Unadjusted Odds Ratio	[95% CI]	Adjusted Odds Ratio	[95% CI]
Clinician characteristics				
Specialty				
Women's Health NP (<i>reference</i>)	--	--	--	--
Primary Care NP	0.17	[0.11 0.24]	0.41	[0.23 0.72]
Trained in IUD insertions in practicum	3.89	[2.59 5.85]	1.60	[0.84 3.04]
Age (years)	1.01	[0.99 1.03]	1.00	[0.98 1.03]
White (non-Hispanic)	1.39	[0.76 2.52]	1.02	[0.43 2.44]
Evidence-based attitudes/knowledge				
Low perception of IUD risks	1.89	[1.40 2.57]	1.44	[0.97 2.13]
High level IUD knowledge	3.20	[2.38 4.30]	1.94	[1.35 2.80]
Practice setting				
Provider type				
Hospital-based practice (<i>reference</i>)	--	--	--	--
Private office	1.24	[0.75 2.05]	1.61	[0.85 3.04]
Community clinic	1.37	[0.79 2.38]	1.11	[0.54 2.27]
Urban location	1.91	[1.22 2.98]	1.74	[0.99 3.04]
Region				
West (<i>reference</i>)	--	--	--	--
Midwest	0.45	[0.24 0.84]	0.65	[0.30 1.42]
Northeast	0.62	[0.33 1.15]	1.00	[0.46 2.18]
South	0.38	[0.22 0.65]	0.63	[0.33 1.17]
Patient population				
Female contraceptive patients (#/wk)	1.04	[1.02 1.05]	1.00	[0.99 1.01]
<i>Number of observations</i>			517	

Table 4

Provision of Intrauterine Contraceptives to Female Contraceptive Patients: Multivariable Logistic Regression Results of US Nurse Practitioners

Provide IUD to patients	Unadjusted Odds Ratio	[95% CI]	Adjusted Odds Ratio	[95% CI]
Clinician characteristics				
Specialty				
Women's Health NP (<i>reference</i>)	--	--	--	--
Primary care NP	0.07	[0.05 0.11]	0.19	[0.10 0.38]
Trained in IUD insertions in practicum	6.37	[3.98 10.1]	2.42	[1.10 5.33]
Age (years)	1.01	[0.99 1.03]	1.02	[0.99 1.05]
White (non-Hispanic)	1.55	[0.86 2.78]	3.11	[1.00 9.62]
Evidence-based attitudes/knowledge				
Low perception of IUD risks	1.97	[1.50 2.57]	1.48	[1.00 2.19]
High level IUD knowledge	4.88	[3.50 6.80]	2.87	[1.91 4.32]
Practice setting				
Provider type				
Hospital-based practice (<i>reference</i>)	--	--	--	--
Private office	1.95	[1.19 3.20]	4.54	[1.96 10.51]
Community clinic	2.50	[1.44 4.33]	3.36	[1.27 8.90]
Urban location	1.38	[0.89 2.14]	1.28	[0.52 1.32]
Region				
West (<i>reference</i>)	--	--	--	--
Midwest	0.57	[0.29 1.11]	0.68	[0.37 1.26]
Northeast	0.37	[0.19 0.70]	0.32	[0.16 0.63]
South	0.32	[0.18 0.57]	0.30	[0.16 0.57]
Patient population				
Female contraceptive patients (#/wk)	1.02	[1.01 1.03]	1.01	[1.00 1.02]
<i>Number of observations</i>			518	