

Challenges in Cervical Cancer Prevention

A Survey of U.S. Obstetrician-Gynecologists

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Background: Current cervical cancer prevention recommendations include human papillomavirus (HPV) vaccination, Pap and HPV co-testing, and Pap testing at 3- to 5-year intervals.

Purpose: To examine attitudes, practice patterns, and barriers related to HPV vaccination and cervical cancer screening guidelines among U.S. obstetrician-gynecologists.

Methods: In 2011–2012, a national sample of members of the American Congress of Obstetricians and Gynecologists responded to a 15-item (some with multiple parts) questionnaire assessing sociodemographic characteristics, clinical practices, and perceived barriers to HPV vaccination and cervical cancer screening. Multivariate logistic regression was used to identify factors associated with guideline adherence. Analyses were conducted in 2012.

Results: A total of 366 obstetrician-gynecologists participated. Ninety-two percent of respondents offered HPV vaccination to patients, but only 27% estimated that most eligible patients received vaccination. Parent and patient refusals were commonly cited barriers to HPV vaccination. Approximately half of respondents followed guidelines to begin cervical cancer screening at age 21 years, discontinue screening at age 70 years or after hysterectomy, and appropriately utilize Pap and HPV co-testing. Most physicians continued to recommend annual Paps (74% aged 21–29 years, 53% aged ≥ 30 years). Physicians felt that patients were uncomfortable with extended screening intervals and were concerned that patients would not come for annual exams without concurrent Paps. Solo practitioners were less likely to follow both vaccination and screening guidelines than those in group practices.

Conclusions: This survey of obstetrician-gynecologists indicates persistent barriers to the adoption of HPV vaccination and cervical cancer screening guidelines. Interventions to promote guideline adherence may help improve the quality of cervical cancer prevention.

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Introduction

Recent breakthroughs in the field of cervical cancer prevention include HPV vaccination and testing. Since 2006, HPV vaccination has been recommended for women aged 11–26 years.^{1,2} In 2009, the American Congress of Obstetricians and Gynecologists (ACOG) issued guidelines³ recommending the initiation

of Paps at age 21 years, biennial screening between ages 21 and 29 years, triennial screening for women aged ≥ 30 years with either prior normal Paps or negative concurrent HPV co-testing, and discontinuation of screening at age ≥ 70 years or after hysterectomy for benign indications. In March of 2012, guidelines were issued by the U.S. Preventive Services Task Force, American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology, and subsequently endorsed by the American Congress of Obstetricians and Gynecologists, recommending triennial Paps for women aged 21–29 years and co-testing with Pap and HPV tests at 5-year intervals for women aged 30–65 years, regardless of whether they have received HPV vaccination.⁴

Recommendations do not always translate into practice, however. Although 90% of obstetrician-gynecologists

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administer HPV vaccines in their offices,⁵ HPV vaccination rates are lowest among women aged 19–26 years⁶ who are seen frequently by obstetrician-gynecologists.⁵ By 2007, fewer than half of obstetrician-gynecologists were using Pap and HPV co-testing,⁷ and roughly one quarter had adopted triennial screening intervals.⁸ To our knowledge, there are no empirical studies of the implementation of the ACOG 2009 guidelines³ among obstetrician-gynecologists. Because guideline implementation takes time, understanding the uptake of the 2009 guidelines may predict obstetrician-gynecologists' behavior related to the 2012 guidelines. Between September 2011 and January 2012, prior to publication of the new guidelines, a systematic examination was conducted for the current paper on practice patterns, attitudes, and barriers associated with adherence to ACOG's existing HPV vaccination and cervical cancer screening guidelines among practicing clinicians.

Methods

Participants and Data Collection

More than 90% of obstetrician-gynecologists in the U.S. are members of ACOG. From a list of all ACOG members stratified by age, gender, and geography, 1000 representative obstetrician-gynecologists were selected at random for participation in the survey. The sample was further stratified into two groups: (1) members in ACOG's Collaborative Ambulatory Research Network (CARN), a group of ACOG members who agree to participate in four to six surveys every 12 months ($n=300$); or (2) ACOG members who were not CARN participants ($n=700$).

Potential participants were sent the survey, a cover letter, and a postage-paid return envelope. Those who did not respond to the first mailing were sent up to three additional mailings. Surveys were distributed from September 2011 through January of 2012, prior to the guideline changes. In July of 2012, an abbreviated questionnaire was sent to all nonrespondents. Data from the abbreviated questionnaire were compared with data from the full survey to assess possible nonresponse bias, but were not included in primary analyses. The IRBs at Boston University School of Medicine and the American Congress of Obstetricians and Gynecologists approved the study.

Survey Instrument

Physicians were queried about their screening and vaccination practices as well as barriers that prevented physicians from following the 2009 ACOG guidelines. Data were collected on sociodemographic characteristics including physician age; years in practice; specialty (general obstetrics and gynecology, gynecology only or obstetrics only); gender; race/ethnicity; location of practice by geographic region as well as urbanicity; and primary racial makeup of the physician's practice panel. To examine HPV vaccination and cervical cancer screening practices, a questionnaire was adapted that was validated by Sheinfeld Gorin et al.⁹

among a sample of urban primary care physicians ($n=225$; 52 obstetrician-gynecologists; Cronbach's $\alpha=0.83$). Modifications of the instrument were reviewed with two survey research experts, and modified questions were pilot tested with 15 practicing obstetrician-gynecologists. The final questionnaire included five questions related to HPV vaccination and seven related to cervical cancer screening; some questions had multiple parts (Appendix A, available online at www.ajpmonline.org, provides the complete survey).

The questionnaire included items about whether practitioners offered HPV vaccination; to whom they offered vaccination (based on short case summaries of hypothetical patients); and what percentage of their eligible patients initiated and completed the HPV vaccine series. They also were asked about barriers to vaccination including parents' and patients' concerns, costs, effects on cervical cancer screening, safety and efficacy concerns, and time limitations.^{10–14}

Questions about cervical cancer screening included the ages at which physicians recommended initiation and discontinuation of screening, recommended screening intervals, practices around Pap and HPV co-testing, and perceptions of categories of high-risk patients who would not qualify for extended screening. In anticipation that many physicians continued to perform annual screening, an exploration was made of potential barriers to extending screening intervals, including patient and physician discomfort with guidelines, concerns that women would not present for annual well woman care or would not receive adequate screening if intervals were extended, and financial concerns.^{15–17}

Data Analysis

To determine factors associated with adherence to HPV vaccination and cervical cancer screening guidelines, separate analyses were performed to identify correlates of (1) offering HPV vaccination; (2) estimating that most ($\geq 60\%$) eligible patients began the HPV vaccine series; (3) offering HPV vaccination to a hypothetical patient aged 11 years; (4) initiating Pap testing at age 21 years; (5) discontinuing screening in low-risk women aged > 70 years; (6) discontinuing screening after hysterectomy for benign indications; (7) recommending biennial Paps between ages 21 and 29 years; (8) continuing annual Paps instead of extending screening intervals in women aged ≥ 30 years; and (9) appropriately using Pap and HPV co-testing. Differences in the sociodemographic characteristics of participating physicians according to the outcomes above were assessed using student t -tests and chi-squared tests. Although a backward stepwise model selection was performed first, variables that were associated with the outcomes in other studies were excluded; thus, the final model included both variables significant in the backward stepwise model and others of interest, such as gender, geographic region, and practice type. Analyses were conducted in 2012 using SAS 9.2.

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Results

A total of 1000 surveys were distributed, 20 physicians were excluded because of retirement or being unreachable, and 397 physicians returned surveys for a total

response rate of 40.5%, consistent with other national ACOG studies.^{5,18} Thirty-one participants were excluded because of incomplete responses, leaving 366 participants in the final sample. Participants' average age and years in practice were 53 and 21, respectively (Appendix B, available online at www.ajpmonline.org). Half of physicians were male, and 83% were non-Hispanic white. Physicians were located throughout the U.S. and practiced in a variety of settings. Consistent with U.S. demographics,¹⁹ 72% reported that the majority of their patients were white. Most physicians (75%) were generalists, and 23% practiced gynecology only. Fifty-five percent of physicians were in group practices, and 20% had solo practices.

Human Papillomavirus Vaccination

Human Papillomavirus vaccination rates are low.

Almost all (92%) practitioners offered HPV vaccines (Appendix C, available online at www.ajpmonline.org). Physicians in group practices were more likely to offer vaccination than solo practitioners (OR=5.29, 95% CI=1.53, 18.27), whereas obstetricians were less likely to offer vaccination than generalists and gynecologists (OR=0.03, 95% CI=0.003, 0.21; Appendix D, available online at www.ajpmonline.org). Only 27% of those surveyed estimated that the majority ($\geq 60\%$) of eligible patients began the vaccine series, however, and only 29% of physicians estimated that almost all ($\geq 80\%$) patients who began the series completed it. Male physicians were less likely than female physicians to estimate that most of their eligible patients were vaccinated (OR=0.56, 95% CI=0.32, 0.97).

Physicians more comfortable vaccinating those aged 13 years than those aged 11 years. Most (96%) practitioners would recommend HPV vaccination to a hypothetical patient aged 13 years, but only 73% would recommend vaccination to a patient aged 11 years ($p < 0.0001$; Appendix C, available online at www.ajpmonline.org). Male physicians were less likely than female physicians to offer HPV vaccination at age 11 years (OR=0.57, 95% CI=0.34, 0.94; Appendix D, available online at www.ajpmonline.org). Approximately 80%–90% of physicians adhered to guidelines recommending vaccination to women with a history of multiple partners, abnormal Pap, or genital warts, and up through age 26 years (Appendix C, available online at www.ajpmonline.org). Only 40% of physicians offered vaccination to lactating women, which is permissible under current guidelines, and 10% offered the vaccine to pregnant women, which is not recommended.¹

Patient refusal, financial concerns, and forgetting to offer vaccine hinder vaccination. When asked about barriers (Appendix C, available online at www.ajpmonline.org), many participants stated that parents declined to vaccinate their daughters (56%), and young adult women declined vaccination for themselves (22%–42%). Twenty-three percent of physicians mentioned financial barriers. Twenty-one percent forgot to offer the vaccine. Few physicians had concerns about vaccine efficacy or safety, or that vaccination would negatively affect future cervical cancer screening behavior (1%–2%). Thirty-one percent of physicians reported no major barriers to vaccination.

Cervical Cancer Screening: Pap and Human Papillomavirus Testing

Half of physicians initiate and discontinue screening consistent with guidelines. Fifty-seven percent of physicians initiated Paps at age 21 years (Appendix E, available online at www.ajpmonline.org). Solo practitioners were one third as likely as those in community hospital or university-based practices to initiate screening at 21 years (community hospital OR=3.65, 95% CI=1.39, 9.61; university OR=3.76, 95% CI=1.26, 11.25; Appendix F, available online at www.ajpmonline.org). Forty-five percent of those surveyed discontinued screening at age 70 years in low-risk patients.

Solo practitioners were half as likely as those in group practice and university settings (group practice OR=2.08, 95% CI=1.06, 4.07, university OR=7.87, 95% CI=2.58, 23.99); and male physicians were half as likely as female physicians to discontinue screening at age 70 years (OR=0.58, 95% CI=0.34, 0.96). Sixty-one percent of physicians discontinued screening after a hysterectomy for benign indications. Solo practitioners were three- to six-fold less likely than those in other practice settings (community hospital OR=2.94, 95% CI=1.16, 7.49; university OR=3.59, 95% CI=1.24, 10.41; other 6.13, 95% CI=1.59, 23.67); male physicians were half as likely as female physicians (OR=0.55, 95% CI=0.33, 0.92); and practitioners in the South were half as likely as those in the Northeast or West to discontinue screening after hysterectomy (Northeast OR=2.04, 95% CI=1.07, 3.86; West OR=2.19, 95% CI=1.11, 4.30).

Half of physicians adhere to extended screening intervals. Most physicians continue to screen annually for all women (74% between ages 21 and 29 years; 53% aged ≥ 30 years; Appendix E, available online at www.ajpmonline.org). Physicians in university practices were three times more likely than solo physicians to offer biennial screening between ages 21 and 29 years (OR=3.43, 95% CI=1.20, 9.81); and physicians in the West were more

likely to do so than those in the South (OR=4.03, 95% CI=1.93, 8.42; Table 5). Solo practitioners were more likely to screen annually at ages >30 years than those in other practice settings (community OR=0.40, 95% CI=0.17, 0.99; university OR=0.27, 95% CI=0.10, 0.74; other OR=0.32, 95% CI=0.11, 0.97); and physicians in the West were less likely to use annual screening than those in the South (OR=0.26, 95% CI=0.13, 0.51). Most obstetrician-gynecologists were aware of high-risk patients who required annual screening: HIV-infected or immunosuppressed (99%); DES-exposed (83%); or history of moderate-severe dysplasia (87%). Approximately one quarter (26%) would continue annual screening after a remote history of low-grade dysplasia, which is not recommended (see Appendix E, available online at www.ajpmonline.org).

Patient concerns and fear of decreasing well woman care hindered extending intervals. More than 70% of physicians felt that patients were uncomfortable screening less frequently than annually, although 81% stated that they were personally comfortable with extended intervals (Appendix E, available online at www.ajpmonline.org). Half of physicians surveyed, however, were concerned that women would not come for annual exams if a Pap was not offered and that extended intervals would lead to inadequate screening. Only 8% reported financial concerns. Seventeen percent of physicians found no barriers to extending screening intervals; 18% offered annual screening to all patients.

Half of physicians use Pap and human papillomavirus co-testing consistent with guidelines. Forty-five percent of practitioners offered Pap and HPV co-testing to women age ≥ 30 years, 21% offered only if requested by the patient, 11% screened all women with both tests, and 23% did not offer HPV testing (Appendix E, available online www.ajpmonline.org). Physicians in the Northeast were more likely to follow ACOG recommendations for co-testing than those in the South (OR=2.78, 95% CI=1.44, 5.36), and those in rural or military practices were less likely to use co-testing than those in suburban practice settings (OR=0.11, 95% CI=0.04, 0.35; Appendix F, available online at www.ajpmonline.org).

Very few physicians adhere to all cervical cancer screening guidelines. A total of 16 physicians (4%) reported adherence to all ACOG 2009 guidelines for cervical cancer screening: initiating screening at age 21 years; performing biennial screening for ages 21-29 years and triennial screening for women aged ≥ 30 years; using Pap and HPV co-testing in women aged >30 years; and

discontinuing screening for those aged >70 years and after hysterectomy for benign indications.

Abbreviated questionnaire to nonresponders. The 77 nonrespondents who returned the abbreviated questionnaire did not differ from those who responded to the full survey in age, gender, likelihood of estimating that most (>60%) of their patients began or completed the HPV vaccine series, recommendation to initiate Paps at age 21 years, or use of co-testing in women aged ≥ 30 years, but were less likely to offer HPV vaccination (81% vs 92%, $p=0.006$).

Discussion

This survey of a national sample of obstetrician-gynecologists reveals limited implementation of HPV vaccination and cervical cancer screening guidelines 6 and 3 years, respectively, after guideline publication. This survey occurred prior to release of the new 2012 guidelines and may portend very slow uptake of these guidelines unless efforts are made to hasten implementation. Although nearly all physicians offered HPV vaccination to their patients, only one third estimated that most eligible patients received vaccination.

Approximately half of obstetrician-gynecologists complied with recommendations regarding the ages of initiation and discontinuation of screening, use of Pap and HPV co-testing, and extended screening intervals. Unfortunately, survey results indicated that more physicians followed non-evidence-based practices, such as continuing screening for women aged >70 years and for those who had hysterectomy for benign indications, than adhered to current evidence-based recommendations. Although implementing new clinical guidelines can be challenging, current recommendations have the potential to substantially reduce rates of genital warts, cervical, vaginal, and vulvar dysplasias.^{1,4,20-24}

The current data indicate that patient and physician interactions may pose important barriers to guideline implementation. In the current survey and others,⁵ providers stated that the largest barrier to HPV vaccination was patients and parents declining to receive the vaccine. However, studies indicate that most patients support HPV vaccination,¹⁰ and that a strong physician recommendation is the most important determinant of vaccine uptake in young women.²⁵⁻²⁸

When asked about Pap testing, 80% of providers felt that the biggest barrier to extended interval screening was patients' discomfort with giving up an annual Pap. However, data from more than 300,000 women in the Kaiser Permanente healthcare system indicated that more than 90% opted for triennial HPV and Pap

co-testing when it was offered.²⁴ In addition, women ranked patient-provider relationships higher than Paps as reasons to undergo an annual exam.²⁹ Thus, the current findings may indicate gaps in physician-patient communication. Discussing the data behind HPV vaccination and extended cervical cancer screening intervals with patients takes time, and such discussions are poorly reimbursed. Perhaps public education on the benefits of HPV vaccination and extended screening intervals, and provider education on the most efficient way to communicate with patients, would help to speed guideline adoption.

The current study also showed associations between providers' personal and practice characteristics and guideline adoption. Overall, solo practitioners were the least likely to adhere to guidelines, being less likely to offer HPV vaccination to patients, initiate screening at age 21 years, screen at extended intervals, and discontinue screening in women aged >70 years or who had undergone hysterectomy. Physicians in academic and group settings have been shown to adhere to guidelines more closely than solo practitioners,^{12,30} perhaps because of improved access to new information and sharing of knowledge among colleagues. Financial pressures also may influence practice differently in solo compared with group practices; more solo practitioners reported financial barriers to providing HPV vaccinations than providers in other practice settings.

Also noted was the fact that female physicians were more likely than male physicians to offer HPV vaccination starting at age 11 years, vaccinate the majority of eligible patients, and to discontinue screening when appropriate. Previous literature notes gender-specific differences among obstetrician-gynecologists^{31,32} and also indicates that patients of female physicians were more up-to-date on preventive services and vaccinations.^{32,33}

Physicians in the South also were less likely than those in other regions to adhere to guidelines for extended interval screening, Pap and HPV co-testing, and discontinuation of screening. Geographic variation in provision of general medical and obstetric care,³⁴⁻³⁷ including HPV vaccinations,³⁸ that is independent of physician and patient characteristics has been well documented, although the reasons underlying regional variation are poorly understood.

Some practice patterns in the West may be influenced by the presence of the Kaiser Permanente healthcare system, which insures up to 30% of the population in California³⁹ and also has a substantial presence in other western states including Colorado, Oregon, Washington, and Hawaii. All Kaiser physicians work within a single system of insurance, outpatient clinics, and hospitals, and substantial emphasis is placed on uniform provision of preventive care by

providers, including vaccination and cervical cancer screening. The Northeast, however, has neither a predominant healthcare system nor a disproportionate number of academic medical centers that might explain higher rates of guideline adherence; its regional variation has been similarly difficult to explain in relation to other medical procedures.⁴⁰ Solo practitioners, male practitioners, and those in the South may thus represent important target groups when disseminating guidelines into practice.

Limitations

This study has several limitations. Physicians self-reported their behavior, which may overestimate adherence to guidelines. The overall response rate was 41%, raising the possibility of selection bias. However, these response rates are similar to those in other surveys of ACOG members,^{5,18,30} and the current brief survey of nonresponders indicated similar screening practices to responders but lower likelihood of offering HPV vaccination, which would suggest, if anything, an overrepresentation of guideline compliance among survey participants.

Participants who chose to respond to the survey may differ from the general population of ACOG members. Most physicians and most physicians' patient panels in this survey were white. Given the small number of black and Hispanic women in the sample, among whom the risk for cervical cancer is highest,⁴¹ it was not possible to conduct subgroup analyses. Also, no data were collected on the race/ethnicity concordance of physicians and patients, or the primary language spoken by either, so the impact of any cultural differences on practice could not be evaluated.

No assessment was made of the age makeup or physician panels, nor did we explore physician attitudes toward HPV vaccination for men, as only obstetrician-gynecologists were surveyed. For those aged 11 years, most see a pediatrician for their care as opposed to an obstetrician-gynecologist, so the opinions of the latter may not be representative of the physician group that has the most contact with this patient population. Finally, reasons for variation by practice type, gender, and geographic region were not explored in this study; this would be better accomplished by additional targeted surveys or qualitative research.

Conclusion

This survey, conducted prior to publication of the 2012 guidelines, indicated that less than one third of obstetrician-gynecologists successfully vaccinated their eligible patients, and approximately half adhered to cervical cancer prevention guidelines published 3 years

previously. In light of persistently low HPV vaccination rates,⁴² and new guidelines recommending Pap and HPV co-testing at 5-year intervals,⁴ programs to educate physicians and patients on the evidence behind universal HPV vaccination and extended-interval cervical cancer screening with Pap and HPV co-testing could help improve the quality of cervical cancer prevention.⁴³

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Appendix

Supplementary data

Supplementary data associated with this article can be found in the online version at <http://dx.doi.org/10.1016/j.amepre.2013.03.019>.

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