

# Physicians', Nurses', and Medical Assistants' Perceptions of the Human Papillomavirus Vaccine in a Large Integrated Health Care System

Jordan Mills, DO, PhD; Patrick Van Winkle, MD; Macy Shen, PhD; Christina Hong, MD; Sharon Hudson, PhD

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## ABSTRACT

**Context:** Vaccination against the human papillomavirus (HPV) decreases risks of cancer and genital warts and the need for gynecologic procedures, yet nationwide vaccination rates are low. Previous surveys exploring this phenomenon have not included input from nurses and medical assistants, who play integral roles in HPV vaccine delivery.

**Objective:** To understand perceptions of HPV vaccine delivery among physicians, nurses, and medical assistants in a large integrated health care system in Southern California.

**Design:** Online surveys were sent to 13 nurse administrators and 75 physicians. Physicians were instructed to forward the survey to nurses and medical assistants with whom they work.

**Results:** A total of 76 surveys were completed, consisting of 52 physicians, 16 clinical nurses and medical assistants, and 8 nurse administrators. Physicians' perceptions of vaccine safety or strength of recommendation did not differ by specialty department. Physicians reportedly perceived the HPV vaccine as safer than did clinical nurses and medical assistants ( $p < 0.001$ ), who indicated they wanted more education on the safety and efficacy of the vaccine before being comfortable strongly recommending it. Respondents advised that all clinicians could improve in their roles as HPV vaccine advocates through patient counseling and providing informational literature and that workflow standardization was needed to minimize missed vaccination opportunities.

**Conclusion:** Physicians reportedly perceive the HPV vaccine as safer compared with nurses and medical assistants. Both groups think that more education of nonphysician staff is needed. Having proper systems in place is also vital to improving vaccination compliance.

demonstrated decreased risks of cervical cancer and genital warts and the need for fewer gynecologic procedures, including colposcopy and the loop electrosurgical excision procedure.<sup>4</sup> Despite the reported safety and efficacy of HPV vaccines as well as the potential impact on the eradication of preinvasive and invasive carcinomas associated with HPV, a national problem exists in the initiation and completion rates of the vaccine series.

The CDC estimates that only one-third of eligible women have initiated vaccination, and the initiation and completion rates have varied from 14% to 56% and from 24% to 56%, respectively.<sup>5-7</sup> In 2012, according to the CDC,<sup>1</sup> 53.8% of girls received the first dose of the series, and 33.4% completed all 3 doses of the series; most HPV vaccines are delivered in the primary care setting.<sup>8</sup> Between 2007 and 2009, HPV uptake in a university-based primary care system among 11,535 eligible women was only 18%,<sup>9</sup> and only 10% of this group received all 3 doses. In addition, a 2010 survey of 1741 men aged 18 to 26 years reported that 51.8% had heard of HPV, but only 34.8% had heard of the HPV vaccine.<sup>10</sup> A university-based pediatric practice reported that 82% of adolescents had missed opportunities for HPV vaccination during preventive care visits between 2006 and 2011.<sup>11</sup>

The struggles of national HPV vaccination programs are not limited to health care systems outside Kaiser Permanente (KP). Although KP is an integrated health care system with a proven track record in vaccination programs such as influenza

## INTRODUCTION

The Centers for Disease Control and Prevention (CDC) reports that 79 million Americans are infected with the human papillomavirus (HPV), with 14 million new cases detected each year; plus, HPV contributes to an estimated 26,200 new cancers each year in the US.<sup>1</sup> In addition to malignancy, HPV causes premalignant diseases, anogenital warts, and laryngeal papillomatosis, which makes it the most common sexually transmitted infection and the cause of a substantial economic burden on the US health care system.<sup>2</sup>

Vaccination against HPV has been available for girls since 2006 and boys since 2011

as 2 inactivated vaccines. Gardasil (Merck & Co, Kenilworth, NJ) is a quadrivalent vaccine against HPV Types 16, 18, 6, and 11, and Cervarix (GlaxoSmithKline, Brentford, Middlesex, UK) is a bivalent vaccine for HPV Types 16 and 18. Currently, HPV vaccination consists of a 3-dose series approved by the US Food and Drug Administration and endorsed in the US by the Advisory Committee on Immunization Practices.

HPV vaccination provides both clinical effectiveness and economic benefits to all international health care systems, and statistical models consistently show the cost and quality benefits that will be achieved.<sup>3</sup> Vaccination against HPV has already

Jordan Mills, DO, PhD, is an Addiction Medicine Fellow in the Department of Family Medicine and Community Health at the University of Wisconsin School of Medicine and Public Health in Madison. E-mail: millsdoc@gmail.com. Patrick Van Winkle, MD, is a Pediatric Hospitalist at the Anaheim Medical Center and the Pediatric Area Research Chair for Kaiser Permanente Orange County in CA. E-mail: patrick.j.vanwinkle@kp.org.

Macy Shen, PhD, is a Postdoctoral Scholar in the Department of Oral Biology and Medicine at the University of California Los Angeles School of Dentistry. E-mail: macy.macy@gmail.com. Christina Hong, MD, is an Obstetrician/Gynecologist at the Orange County Medical Center in Irvine, CA. E-mail: christina.x.hong@kp.org.

Sharon Hudson, PhD, is a Behavioral Scientist in the Department of Research and Evaluation for Kaiser Permanente Southern California in Pasadena, CA. E-mail: sharon.m.hudson@kp.org.

and is a participant of the CDC program, Vaccine Safety Datalink, KP's success with HPV vaccine initiation and completion rates has been limited. In 2007, a Southern California Permanente Medical Group study of 34,193 women reported only a 41.9% series completion rate.<sup>12</sup>

Multiple issues hinder the success of HPV vaccination programs in the US. This vaccination touches on issues of sexuality, parental autonomy, and cost.<sup>6</sup> The main barriers identified are the education of parents and clinicians, financial limits related to access to care, and lack of clinician recommendation. Among parental issues, it was found that lack of personal knowledge and lack of perceived need for the vaccine was reported in 19.4% and 18.8%, respectively.<sup>6</sup> In addition, 18.3% of parents believed their daughters were not sexually active and did not need to be vaccinated, whereas 13.1% of the time they reported not being informed by their clinician of the importance of the vaccine.<sup>6</sup> Moreover, mothers' attitudes toward prevention appear to influence HPV vaccine uptake in adolescent girls, and maternal utilization of preventive care and maternal history of genital warts may influence HPV vaccine uptake in adolescent boys.<sup>13,14</sup> Threats to parental autonomy regarding sex education

and concerns that education programs may undermine abstinence messages or condone risky sexual behavior have been unfounded concerns.<sup>15</sup>

Barriers to vaccine uptake have been addressed in patient and clinician surveys, which have thus far been limited in scope. Previous surveys have either omitted specialties in which the HPV vaccine is given routinely or included only physicians, without attempting to understand the perceptions and experiences of nonphysician staff who may have strong influences on HPV vaccine uptake. In the current study, we aimed to understand perceptions of HPV vaccine delivery in a large integrated health care system in Southern California through a survey of physicians, medical assistants, clinical nurses, and administrative nursing staff in the Pediatrics, Obstetrics and Gynecology (OB/GYN), Family Medicine, and Internal Medicine Departments.

**METHODS**

KP Southern California is a large integrated health care organization serving more than 4 million members. The Orange County Service Area includes 2 hospitals and 16 primary care clinics and is located in a primarily suburban area of Southern California. The

clinics are staffed by registered nurses (RNs), licensed vocational nurses (LVNs), and medical assistants (three groups considered collectively as ancillary staff) who assist physicians with determining which vaccines are needed at any given visit and often communicate this information to patients and their caregivers. The department administrators help set the policies and procedures for the ancillary staff regarding how to communicate with physicians and patients.

A 12-question open- and close-ended survey, developed from previously published clinician surveys,<sup>16,17</sup> was e-mailed directly to selected physicians and department administrators to complete via an online survey tool (SurveyMonkey, Palo Alto, CA; Figure 1 available at: [www.thepermanentejournal.org/images/2016/15-205Fig1.pdf](http://www.thepermanentejournal.org/images/2016/15-205Fig1.pdf)). Physician recipients were asked to forward the survey to the team's lead RNs or LVNs and medical assistants they work with most frequently.

One or two physicians from each of the clinic locations in each subspecialty were selected to participate. Selection was based on the physician's length of tenure with KP, to leverage physician familiarity with KP vaccination protocols and to generate actionable information. Thus, this was a purposive sample rather than a random selection. All

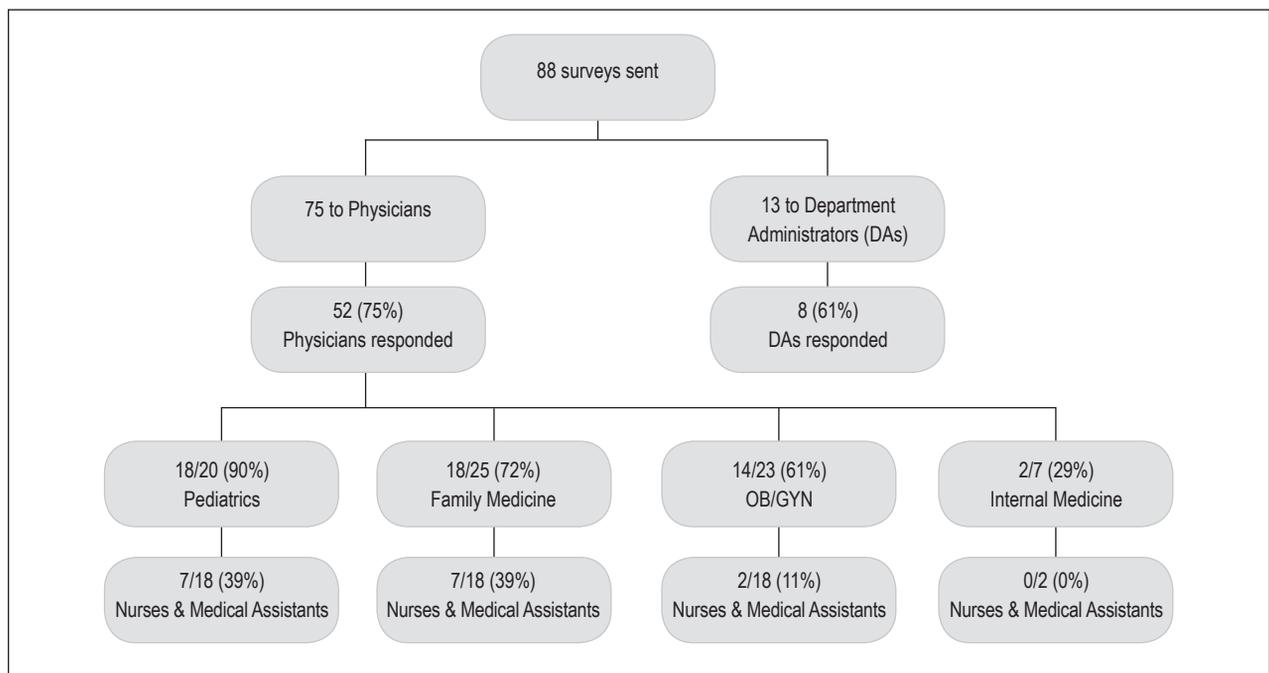


Figure 2. Algorithm of analysis of survey respondents.<sup>a</sup>

<sup>a</sup> Physicians sent the survey to their medical assistants and clinical nurses at our request; we did not send the survey directly to the staff.

OB/GYN = Obstetrics and Gynecology.

department administrators from primary care clinics involved in the administration of the HPV vaccine were selected to participate. (Each clinic has a single department administrator.)

Surveys were sent via a SurveyMonkey link in an e-mail message on October 20, 2014. Recipients were given until December 1, 2014, to complete the survey. At the end of November, an additional e-mail was sent as a reminder to recipients who had not yet completed the survey. Responses were coded independently by 2 members of the research team and then consolidated and entered into a spreadsheet (Microsoft Excel, Microsoft, Redmond, WA).

Chi-squared tests were conducted to compare categorical response rates regarding respondents' perceptions of vaccine safety and reported strength of recommendation to patients by specialty department (OB/GYN, Pediatrics, Family Medicine, and Internal Medicine) and by respondent role (physician, clinical nurse, and medical assistant). Data were analyzed with statistical analysis software (SAS [Statistical Analysis System] Version 9.2, SAS Institute Inc, Cary, NC). Statistical analyses were 2-sided, and  $p < 0.05$  was considered significant. Nonclinical nurses were excluded in the statistical analysis because of low sample size ( $n = 8$ ). Responses from family medicine and internal medicine physicians were combined for categorical comparisons because of the low number of internal medicine responses ( $n = 2$ ).

## RESULTS

A total of 76 respondents returned completed surveys, most of whom were physicians ( $n = 52$ , 75% response rate). Physicians in the Family Medicine Department ( $n = 18$ ) and the Pediatrics Department ( $n = 18$ ) were the most responsive. Response rates were lower for clinical nurses and medical assistants (31%) and for nonclinical nurses (administrators; 61%; Figure 2).

### Perceptions of Vaccine Safety

Perceptions of vaccine safety between physicians in different departments and between physicians and clinical nurses and medical assistants are shown in Tables 1 and 2, respectively. There was no significant difference in perceptions of vaccine safety between physicians by specialty

department, but overall physicians did perceive the vaccine to be safer than did clinical nurses and medical assistants.

Two pediatricians cited concerns regarding adverse neurologic effects of the vaccine. They reported: "Some neurologic concerns have surfaced regarding this vaccine. I am a little concerned" and "I have some hesitation because anecdotally I have had patients who have experienced neurological symptoms and refuse beyond their first dose." The author of the first quotation reported perceiving the vaccine as very safe and recommending it somewhat strongly to patients, whereas the author of the second quote reported perceiving the vaccine as somewhat safe and recommending it very strongly to patients. Thus, only a small number of physicians

were concerned specifically about neurologic effects of the vaccine, and they still tended to recommend it to patients. In addition to neurologic concerns, 5 respondents cited concerns about dizziness/fainting after vaccine administration; 4 reported witnessing this in their patients. Interestingly, despite this concern, 2 of the 5 reported somewhat strongly recommending, and 3 of the 5 reported very strongly recommending the vaccine to patients.

### Reported Strength of Recommendation

There was no significant difference in strength of recommendation of the vaccine between physicians by specialty department (Table 1) or between physicians and clinical nurses/medical assistants (Table 2).

**Table 1. Physicians' perceptions of vaccine safety and strength of recommendation by subspecialty department<sup>a</sup>**

Perception	Pediatrics (n = 18), no. (%)	OB/GYN (n = 14), no. (%)	Family and internal medicine (n = 20), no. (%)	p value
<b>Vaccine safety</b>				
Very safe	16 (89)	14 (100)	20 (100)	0.14
Somewhat safe	2 (11)	0 (0)	0 (0)	
Somewhat unsafe	0 (0)	0 (0)	0 (0)	
Very unsafe	0 (0)	0 (0)	0 (0)	
<b>Strength of recommendation</b>				
Very strong	15 (83)	12 (86)	13 (65)	0.35
Somewhat strong	3 (17)	2 (14)	5 (25)	
Somewhat weak	0 (0)	0 (0)	2 (10)	
Weak	0 (0)	0 (0)	0 (0)	

<sup>a</sup>  $\chi^2$  analysis by physician specialty department.  
OB/GYN = obstetrics and gynecology.

**Table 2. Perceptions of vaccine safety and strength of recommendation by provider type<sup>a</sup>**

Perception	Physicians (n = 52), no. (%)	Clinical nurses and medical assistants (n = 16), no. (%)	p value	Nonclinical nurses (n = 8) <sup>b</sup> , no. (%)
<b>Vaccine safety</b>				
Very safe	50 (96)	8 (50)	< 0.001	3 (38)
Somewhat safe	2 (4)	8 (50)		2 (25)
Somewhat unsafe	0 (0)	0 (0)		2 (25)
Very unsafe	0 (0)	0 (0)		1 (13)
<b>Strength of recommendation</b>				
Very strong	40 (77)	9 (56)	0.11	5 (63)
Somewhat strong	10 (19)	7 (44)		1 (13)
Somewhat weak	2 (4)	0 (0)		1 (13)
Weak	0 (0)	0 (0)		1 (13)

<sup>a</sup>  $\chi^2$  analysis compared responses of physicians vs clinical nurses and medical assistants. Nonclinical nurses were not included in the statistical analysis because of low sample size.

<sup>b</sup> Percentage does not total to 100 because of rounding.

Five respondents (2 physicians and 3 nurses and medical assistants) reported a perceived need for more education on the safety and efficacy of the HPV vaccine for nonphysicians. Sample comments were as follows: *"With better understanding of [the] topic, staff can do more patient teaching,"* and *"Educate back-office staff so they feel stronger in recommending the vaccine."*

### Respondent-Reported Reasons Given by Patients and Parents for Declining Vaccine

The most common reason for refusing the HPV vaccine identified by parents to the respondents was that the vaccine is not safe because it is too new (n = 22), or the patient is too young and thus vulnerable to side effects (n = 11). Specifically for males, 11 respondents reported that parents think the risk of HPV for males is low; thus, there is no need for the vaccine. For instance, one respondent said, *"[Parents think] that it does not affect males so there is no reason to get it."*

Another common reason given for not wanting the vaccine is because the virus is transmitted sexually. Most respondents reported that patients and parents deny sexual activity and thus perceived no need for the HPV vaccine. Comments reportedly heard from parents included the following: *"My child is not having sex"; "We don't believe in premarital sex"; "My daughter is not sexually active [or] promiscuous; we go to church [and] she is not that kind of girl."* This link between the vaccine and a sexually transmitted disease (STD) was inherently part of the language used by respondents to illustrate their patients' perceptions and beliefs. Another said, *"They don't need an STD vaccine at their age."*

### Counseling Topics

The most common point that respondents reported discussing with female patients in relation to the HPV vaccine was the decreased risk of cervical cancer (n = 50), followed by the decreased risk of genital warts (n = 17). The most common point that respondents reported discussing with male patients was decreased risk of anogenital cancer (n = 32), followed by decreased risk of anogenital warts (n = 19). For both female and male patients, the third most common topic discussed by respondents was the ubiquitous nature of the virus as a sexually transmitted infection with no cure that

can be asymptomatic and easily transmitted (n = 29 for males and n = 22 for females). Nine respondents reported that they emphasize the decrease in risk of abnormal results of Papanicolaou tests and thus the need for additional procedures such as colposcopy.

Eleven respondents thought that both physicians and ancillary staff could improve in their respective roles as HPV vaccine advocates. Specific areas for improvement identified included consistency of message (*"Train providers to have [a] consistent message regarding benefits"*), assertiveness (*"Physicians [need] to be more engaged in explaining the vaccine"*), and completeness (*"I find the parents who refuse never got a full explanation"*). One OB/GYN reported regularly using self-disclosure to advocate for the HPV vaccine: *"I let everyone know I vaccinated my own child."* Ten respondents reported that they emphasize the nature of the HPV vaccine as a three-dose series.

### Workflow/Institutional Procedures

Thirteen distinct workflows were reported by respondents to describe the events of an office visit in which the patient is identified as eligible for the initial HPV vaccine dose. There was no clear pattern when evaluated by department specialty or role as physician, nurse, or medical assistant. Three physicians reported that they teach their medical assistants to put the vaccine in the chief complaint section of the patient encounter. Moreover, two of the three physicians indicated that this is an established protocol but that the medical assistants do not routinely do it.

KP Orange County uses Epic software (Epic Systems Corp, Verona, WI) for its electronic medical records in the inpatient and outpatient settings. During a clinic encounter, ancillary staff are taught to "pend" certain orders (including the HPV vaccine) in the order entry section of the encounter. Physicians can then simply sign the order with a click of the mouse. In our sample, 2 physicians saw a need for improvement in this practice by ancillary staff. For example, one stated, *"If my medical assistant doesn't pend [the HPV vaccine order], I forget to look."*

Nearly all respondents reported that after administration of the first HPV dose, the patient is advised verbally to get the second and third doses by the physician (n = 35),

nurse or medical assistant (n = 38), or both (n = 28). Thirty-one respondents reported including some type of recommendation in the printed handout given to patients at the conclusion of the encounter. Five reported that often 1 or all of these steps are overlooked during the visit. Twenty-nine respondents indicated that an effort is made to schedule a follow-up appointment with a nurse for the next HPV vaccine dose before the patient is discharged home from the encounter. Half of the respondents recommended some kind of reminder system after the first HPV vaccine dose, by text message, e-mail, phone, or postal mail (n = 38). Eleven respondents recommended contacting patients who do not come for follow-up visits with a nurse for their second and third doses to reschedule.

Nine respondents emphasized the importance of initiating the vaccination series before the advent of sexual activity. Four respondents recommended that physicians broach the subject of the HPV vaccine with parents well before the patient reaches age 9 years by providing information on HPV and the vaccine via mail, e-mail, or phone or through direct discussion at well-child examinations. One pediatrician recommended routinely starting the series at age 9 rather than age 11 years.

## DISCUSSION

### Common Themes of Survey

In the current survey, all physicians reported perceiving the HPV vaccine as somewhat safe or very safe. Such a strong testament to the safety of the vaccine has not been observed in previous surveys, in which at least a few physicians have considered the HPV vaccine unsafe, with some even choosing to not recommend it for eligible patients.<sup>18,19</sup> Proportionally more of these clinicians have been family physicians rather than pediatricians or OB/GYNs. In a survey of 1013 physicians, the pediatricians and OB/GYNs were more likely than family physicians were to "always" recommend the vaccine.<sup>20</sup> In contrast, we found no difference in perception of vaccine safety or strength of recommendation between family physicians, pediatricians, or OB/GYNs. Possible explanations for this include our relatively small sample size, the emphasis placed on preventive medicine at KP as an integrated health care system, and

mounting data providing reassurance that the vaccine is safe.<sup>6,7</sup> Surveys continue to identify safety as the predominant concern among patients and parents.<sup>17,21,22</sup>

The most commonly reported safety concern by physicians and ancillary staff in our survey was the potential for adverse neurologic effects associated with the HPV vaccine, specifically fainting immediately after vaccine administration. This adverse effect was found to be so common after vaccine licensure that the US Food and Drug Administration changed prescribing information to include information about preventing falls and possible injuries from fainting after HPV vaccination, although the vaccine benefit-risk profile was still considered acceptable in adolescent girls and women.<sup>23</sup> A few respondents cited general neurologic disease as an additional concern. A recent study of almost 4 million women in Denmark and Sweden followed-up from 2006 to 2013 showed no association between the HPV vaccine and the development of multiple sclerosis or other demyelinating diseases.<sup>24</sup>

Besides physician input, there is potential value in the thoughts of nonphysician staff who interact directly and indirectly with patients and parents to influence decision making, which previous surveys have not explored. We observed that physicians reportedly perceive the HPV vaccine as safer than do clinical nurses and medical assistants. Several respondents, including clinical nurses and medical assistants, reported a need for more education for ancillary staff about the safety and efficacy of the HPV vaccine. Medical assistants, nurses, and possibly even receptionists involved in direct patient care may greatly influence the decision making of parents and patients, and their role in the advocacy for the HPV vaccine deserves further study. A follow-up study with a larger sample size of medical assistants and nurses with assurance of anonymity is needed.

Although 100% of physicians and clinical nurses/medical assistants in our sample reportedly considered the HPV vaccine as somewhat or very safe, one-fourth and one-eighth of nonclinical nurses reportedly considered the HPV vaccine as somewhat and very unsafe, respectively. Additionally, 1 nonclinical nurse (administrator) reported weakly recommending the vaccine compared with no physicians or clinical nurses/

medical assistants. Nonclinical nurses at KP are largely involved in establishing workflows used by clinical nurses and medical assistants, in governing how and when to discuss the vaccine with patients, and in facilitating the utilization of the vaccine for the physician (eg, providing the HPV vaccine in the chief complaint of the encounter and/or pending the order for the physician). Because of the integrated and streamlined nature of vaccine delivery at KP, a negative perception of the HPV vaccine among nonclinical nurses may actually impede vaccination efforts to a larger degree than negative perceptions held by clinical nurses and medical assistants involved in direct patient care. This finding highlights the need for education of nonclinical nurses as well as clinical nurses and medical assistants about the safety and efficacy of the HPV vaccine to improve coverage rates as well as the need for workflow standardization for vaccine delivery.

Respondents identified timing as a critical aspect of vaccine delivery, emphasizing the nature of the HPV vaccine as a 3-dose series. In a 2008 KP Northwest survey of 3490 females between ages 11 and 26 years, 899 (26%) responded. Emphasis of the 3-dose schedule from the clinical care team to the patient was predictive of improved rates of series completion.<sup>25</sup>

Another commonly reported counseling point relating to the timing of the vaccine was the importance of initiating the vaccination series before the advent of sexual activity. Second only to safety concerns, parental denial of the patient's sexual activity and the perception of the HPV vaccine as an STD vaccine were cited as major barriers to vaccine uptake, consistent with previous surveys.<sup>26</sup> A recent study of a large cohort of female adolescents found that HPV vaccination was not associated with increases in sexually transmitted infections after one year, suggesting that vaccination is unlikely to promote unsafe sexual activity.<sup>15</sup> Clinicians can use this data to address the STD-vaccine barrier with parents.

Another crucial aspect of vaccine timing—when to give the vaccine—was addressed by survey respondents, yielding novel proposals to help overcome HPV vaccination barriers. Some respondents recommended that the subject of the HPV vaccine be discussed with parents well

before the patient reaches age 9 years, with a single pediatrician recommending starting the series at age 9 years rather than age 11 years, which is still within the CDC recommendations. Adopting such recommendations could serve to educate parents on HPV vaccine safety and efficacy and thereby dispel common myths.

Given the major challenges to improving HPV vaccination coverage, we must be open to trying novel approaches that pose no obvious risk, even if they are not yet validated by large-scale studies. Several specific intriguing recommendations were made by at least one respondent of the current survey, including the practice of self-disclosure (ie, providers advising patients and parents that they give the HPV vaccine to their own children), which has been demonstrated to be a powerful motivational tool in patient-clinician interactions.<sup>27</sup> Other specific suggestions included incentivizing vaccination uptake and completion either financially or in some other way and using presumptive recommendation strategies when discussing the vaccine—“*We have to do some shots*”—instead of “*What do you want to do about shots?*”

### Limitations

The objective of the current study was to obtain sufficient input from physicians, medical assistants, and clinical and nonclinical nurses to compare safety and efficacy perceptions between physicians and ancillary staff and across specialties. Because of the low response rate for clinical nurses and medical assistants (31%), the statistical analysis was not as robust as originally intended. The low response rate was caused by either the physician not sending the survey as requested or the nurses and medical assistants failing to complete the survey after receiving it from the physician. Future surveys should be sent directly to all potential respondents, facilitating direct follow-up for nonresponders. Additionally, the survey did not distinguish between clinical nurses and medical assistants. Both positions involve direct outpatient care but in slightly different capacities. It is certainly possible that individuals from these groups hold different views that could have been overlooked.

Our survey did provide a good mix of responses from Family Medicine, OB/GYN, and Pediatric Departments, but the response

rate from the Internal Medicine Department was low. Most internal medicine physicians in KP Orange County work exclusively or predominantly in the inpatient setting and thus do not have the opportunity to discuss the HPV vaccine with patients, as do family medicine physicians, who work predominantly in outpatient clinics. The two internal medicine physicians who responded do routinely work in the outpatient clinic and occasionally see patients eligible for the HPV vaccine. Statistical analyses were conducted with and without addition of the internal medicine physician responses to those of family medicine physicians, and the results were unchanged.

## CONCLUSION

Physicians perceive the HPV vaccine as safer than do clinical nurses and medical assistants and purport to recommend it more strongly compared with nonclinical nurses. Medical assistants and clinical nurses who serve on the front lines of vaccine advocacy report that they need more education on the safety and efficacy of the HPV vaccine. Concerns about safety and possible promotion of sexual activity are the most frequently reported barriers limiting HPV vaccine coverage. Vaccination uptake may increase through improved advocacy by physicians and ancillary staff, predicated on improved provider and patient education. Workflow standardization is needed to ensure minimization of missed vaccination opportunities. ❖

## Disclosure Statement

The author(s) have no conflicts of interest to disclose.

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