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## Clinician & Parent Perspectives on Educational Needs for Increasing Adolescent HPV Vaccination

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### Abstract

**Introduction**—Human papillomavirus (HPV)-related morbidity and mortality remain a significant public health burden despite the availability of HPV vaccines for cancer prevention. We engaged clinicians and parents to identify barriers and opportunities related to adolescent HPV vaccination within a focused geographic region.

**Methods**—This mixed methods study design used an interviewer-administered semi-structured interview with clinicians (n=52) and a written self-administered survey with similar items completed by parents (n=54). Items focused on experiences, opinions and ideas about HPV vaccine utilization in the clinical setting, family and patient perceptions about HPV vaccination and potential future efforts to increase vaccine utilization. Quantitative items were analyzed using descriptive statistics while qualitative content was analyzed thematically.

**Results**—Suggested solutions for achieving higher rates of HPV vaccination noted by clinicians included public health education, the removal of stigma associated with vaccines, media endorsements and targeting parents as the primary focus of educational messages. Parents expressed the need for more information about HPV-related disease, HPV vaccines, vaccine safety, sexual concerns and countering misinformation on social media.

**Discussion**—Results from this mixed methods study affirm that educational campaigns targeting both health care professionals and parents represent a key facilitator for promoting HPV vaccination; disease burden and cancer prevention emerged as key themes for this messaging.

### Keywords

human papilloma virus; vaccination; adolescents; clinician education; community education

## Introduction

Human papillomavirus (HPV)-related morbidity and mortality remain a significant global public health burden despite opportunities for prevention using HPV vaccines. Infection with oncogenic HPV strains is associated with the development of anogenital and oral cancers/precancers in both males and females.

HPV infection is common, with more than 79 million people in the U.S. having been infected and more than 14 million new infections occurring each year [1]; 50% of new infections occur in young people ages 15-24 [1]. While most individuals can clear acute infection without intervention, a subset, not currently able to be identified, develops chronic persistent infections that can lead to malignancies. The International Agency for Research on Cancer (IARC) classifies oncogenic HPV serotypes as human carcinogens [2]. HPV is transmitted through any skin-to-skin contact, which can lead to infection in susceptible persons [1].

While there are more than 100 types of human papillomavirus, specific types impact disease burden. For example, types 16 and 18 are associated with a majority of cervical and anogenital cancers and precancers, while types 6 and 11 are associated with 90% of genital warts. [3].

Despite recommendations from the Advisory Committee on Immunization Practices (ACIP) for routine HPV vaccination of both males and females at ages 11-12, coverage rates among adolescents remain suboptimal. For parents, certain barriers are well established in the literature including absence of provider recommendation, cost, and lack of education on HPV vaccine [4,5]. Parents also have misperceptions that the vaccination promotes sexual activity [6]. For providers, barriers include lack of knowledge about the vaccine and its related diseases, misperceptions of parental objections and lack of time to discuss vaccine with patients [4]. Both parents and clinicians demonstrate knowledge gaps regarding the prevalence of HPV and disease burden, as well as vaccine safety and long term efficacy [7]. New evidence suggests that the decision to vaccinate against HPV is extremely complex and multifactorial. Young adult women and some adolescents have low risk perception regarding HPV infection which leads to lower rates of vaccination [8]. Education is frequently cited as a critical need in increasing the uptake of HPV vaccination however recent literature indicates that education alone does not appear to be impactful [5,9]. We conducted an environmental scan among clinicians and parents to explore barriers, opportunities, resources, and potential collaborations focused on the issues of HPV vaccination.

## Methods

The mixed-methods approach included an interviewer administered semi-structured interview with clinicians and a self-administered survey with similar items completed by parents.

## Participant Recruitment

Data collection took place between January and April 2015. The population recruited included those with a professional and/or personal interest in the topic of HPV vaccination, adults, and English speaking. Individuals were recruited by approaching members of a regional vaccine coalition across the western region of New York State and by contacting staff at school based health centers, supplemented by snowball sampling. An introductory letter was sent via mail or e-mail to the potential interviewees with the majority of those invited to participate being reached through email. The coalition that facilitated this recruitment activity included public health professionals, pharmaceutical representatives, a travel vaccine office, University campus health offices, and pharmacists.

Self-administered surveys were collected at three separate events during the same time frame (January to April 2015). Parents were recruited through school parent-teacher organization (PTO) groups (one suburban and one rural community) in addition to a workplace networking event for parents.

## Interviews and surveys

All study participants provided oral consent. Three study staff conducted telephone interviews which averaged 25-30 minutes and were digitally recorded. An interview protocol was used to guide the process and included: five demographic items; three practice composition/identification items; 15 closed ended items on quality measures and vaccination rates; 12 Likert scale items on adolescent vaccines (five point scale, strongly agree to strongly disagree); and 14 open-ended questions including items on background, opinions and ideas regarding HPV vaccine utilization related to clinical settings, families and patients perceptions of HPV vaccination; and potential future efforts to increase vaccine utilization.

Survey participants also gave oral consent and completed the questionnaire in 15 minutes. The survey included: six demographic items; 10 Likert scale items on adolescent vaccines (five point scale, strongly agree to strongly disagree); two closed-ended items on opinions and factors that influence HPV vaccination and topics that should be part of the conversation; eight open-ended items on opinions, barriers, challenges, solutions, resources, and recommendations on research questions and priorities to increase rates of HPV vaccination.

## Analysis

Interviews were professionally transcribed and all open-ended questions were entered as text into the QSR NVivo 8 qualitative software (QSR International, Victoria, Australia). Four of the authors coded responses to identify patterns/themes and to compare responses by specialty and clinical profession. Each coder created a summary of themes and then compared summaries to verify agreement and detect any differences. The authors discussed their final analyses and came to a consensus on the dominant themes. Several Likert scale items from the clinician interview and parent survey addressing opinions on the promotion and implementation of adolescent vaccines were included in the final analysis; these items were quantified to determine an overall response rate.

## Results

### Interview and survey participant characteristics

We approached 134 individuals and successfully completed interviews with 60 participants. These analyses include a sub-sample of 52 clinicians: 46% were physicians; 37% registered nurses or licensed practical nurses and 17% nurse practitioners or physician assistants. Participants were mainly females (75%) and 87% self-identified as white, non-Hispanic. Surveys were conducted with 54 parents and all were at least 18 years old. Survey participants were 88% female, 90% non-Hispanic white, with 54% between ages 18-40 years and 35% between the ages of 41-50 years. Demographic characteristics of the interview and survey participants are further described in Table 1.

### Clinician perspectives on educational needs around HPV vaccination

Participants provided responses to the following item: In your opinion what are the educational needs around HPV vaccination: for MDs/NPs/PAs; for nurses/allied health staff; for parents; and for adolescents. In response to this general inquiry, clinicians discussed several topics as summarized in Table 2. Three dominant patterns emerged across the response categories and included the following themes: (1) Cancer prevention; (2) HPV vaccine efficacy, benefits, and safety; and (3) Provider-patient communication.

Most clinicians discussed the need to communicate cancer prevention information to both parents and adolescents. Some clinicians discussed placing more emphasis on cancer prevention and immunization overall and placing less emphasis on outcomes related to sexual activity. For example one clinician stated, “Drive home long range outcomes over the right now.” Another clinician discussed the severity of cervical cancer and the need for parents to understand that this cancer is preventable.

HPV vaccine efficacy, benefits, and safety topics were discussed across all three response categories with respect to educational needs for MDs/NPs/PAs, nurses/allied health staff, and for parents. Clinicians discussed lack of knowledge pertaining to relevance of vaccine for boys, the appropriate age to start the vaccination process, and “more in-depth knowledge about the goals of vaccination.” Most clinicians also cited the need to better understand side effects and vaccine risks in general as areas of unmet educational need.

The third most discussed topic focused on provider-patient communication around HPV vaccination with respect to the need for clinician training on how to effectively introduce the vaccine during patient visits. Some clinicians responded to this item by suggesting strategies that included: simple language format that did not include medical jargon, team effort, and consistent messaging within the practice at all levels and throughout the patient encounter. Clinicians also recognized the influence of their recommendation as the “single best predictor” of vaccine initiation.

### Parent perspectives on educational needs around HPV vaccination

Lack of education was the most often reported barrier to HPV vaccination uptake noted by parents, including several key topics: HPV-related disease, HPV vaccines, HPV vaccine

safety, sexual concerns and misinformation on social media. Parents stated that they were more receptive to a vaccine recommendation at a well visit compared to an office visit for an acute issue and were not concerned about the number of other adolescent vaccines recommended during a visit.

Education was endorsed by parents as a means to help increase the uptake of HPV vaccine including alleviating concerns about safety and emphasizing cancer prevention. Parents felt strongly that cancer prevention should be the primary theme of the conversation when HPV vaccination was recommended by their health care provider and were less interested in receiving information on sexual activity, sexually transmitted infections and genital warts. Parents also cited school-based education as a potential venue for sharing this important message and offering additional information on this topic. Parents also suggested that educational messages focus more on HPV vaccine efficacy and safety, and the anticipated reduction in HPV-related cancers as a result of vaccination.

### **Clinician and parent response regarding adolescent vaccines: comparison of Likert scale items**

Responses to selected Likert scale items (five-point scale, strongly agree to strongly disagree) for clinician and parent respondents are presented in Table 3. A large majority of clinicians and parents strongly agreed/agreed that promotional messages about the HPV vaccine should focus on cancer prevention with clinicians offering stronger endorsement ( $p=0.01$ ). Both groups also strongly endorsed (strongly agree/agree) greater promotion of HPV vaccine using TV ads (clinicians, 94%, and parents, 77%;  $p=0.08$ ) or magazines (clinicians, 85%, and parents, 79%;  $p=0.65$ ). Slightly over 65% of clinicians and 44% of parents strongly agree/agreed that the HPV vaccine should be given to children ages 9-10 years ( $p=0.043$ ).

### **Discussion**

Results from this mixed-methods study affirm that education represents a potential facilitator of HPV vaccination as knowledge gaps and misperceptions were commonly cited by both clinicians and parents as barriers. Both groups of participants noted the lack of topic specific knowledge as a significant barrier to vaccination and as the most often cited solution for increasing HPV vaccine uptake. Clinicians noted communication strategies and educational deficits as representing important educational gaps among clinicians, nurses, parent and adolescents (see table 2). Analysis of key themes from interviews identified a need for improved message delivery and communication between clinicians and parents; the strongest predictor of HPV vaccination is a physician recommendation [10]. A retrospective review identified missed opportunities to administer HPV vaccine among 87% of unvaccinated boys and 84% of unvaccinated girls, which emphasizes the need for both greater urgency to complete vaccination and strong consistent vaccination recommendations [11]. Additionally, communication strategies have been identified as a primary solution to increase HPV vaccine rates [12]. Message content and approach were pervasive themes in our study, supporting the need for the development, testing and dissemination of effective communication strategies and skills training for clinicians. A majority of respondents in both

the clinician and parent groups endorsed the cancer prevention potential of HPV vaccines, although parents were somewhat less robust in their endorsement compared to clinicians. Clarifying this knowledge gap and using general media channels and school-based programs to emphasize the cancer prevention benefits of the HPV vaccine may represent an opportunity to promote a sense of urgency for parents to have their children vaccinated.

Delivering these educational messages on HPV vaccination to the general public might be addressed through direct-to-consumer advertising as a strategy to drive vaccination of their children and to empower parents to initiate further dialogue on HPV vaccination with their health care clinician. Our results noted strong clinician and parent support for increasing education through the use of television and magazine advertisements. This reinforces the desire by clinicians for general parental education on vaccines as well as to drive parent interest for more information on this topic. While this is important, a recent meta-analysis by Fu et al., (2014) concluded that this passive education alone is insufficient to impact vaccine completion and requires an ongoing platform of audience-specific tailored messaging and citing specific modalities that offer the first dose of vaccine at the intervention [13]. Another study focused on adolescents noted that educational interventions appear to have a brief window of opportunity for successful vaccine uptake [14]. Ultimately, clinician recommendation followed by vaccine delivery provides the most effective means of HPV vaccine initiation [12].

Interestingly, we noted a difference between respondent groups regarding dosage schedules as a means of improving uptake. Clinicians felt strongly that a two-dose vaccine schedule would help to increase HPV vaccine uptake/completion while parents were less enthusiastic, which could be reflective of clinicians' desire to simplify administration and parental concerns about effectiveness. Of note, ACIP is currently considering a recommendation for a two-dose schedule for HPV vaccine among persons ages 9-14 years old [15]. Clinicians perceive HPV vaccine as less important than Tdap and MCV4 vaccines, which may also be a contributing factor to missed opportunities and/or a lack of urgency in addressing HPV vaccination resulting in suboptimal vaccination rates [6,16]. Moreover, linking vaccine administration for multiple diseases together (e.g., HPV, MCV4 and Tdap vaccines) may help to increase HPV vaccination rates [17].

Other notable educational gaps included a general lack of understanding on the topic of vaccination and challenges among clinicians and nurses to "keep up with the literature" on vaccines. Continuing medical education programming, the development of quality improvement projects and incentive payments might be used to address these gaps. Due in part to their high degree of credibility, nurses play a key role in vaccine delivery and can effectively promote HPV vaccination by understanding disease burden, vaccine effectiveness and safety information, which can be communicated directly to parents and patients [18].

Our results demonstrate that parents desire further information on the benefits of HPV vaccine, its efficacy and the importance of the vaccine as it pertains to cancer prevention. This is consistent with a recent report by Dempsey et al., (2016), which noted that parents want more HPV vaccine-related information and are presently not receiving this from their clinician [19]. Parents are less aware than clinicians of the cancer prevention potential of the

HPV vaccine. We noted strong support for cancer prevention messaging among both clinicians and parents. Advocating for HPV vaccination as a cancer prevention strategy provides an opportunity to impact uptake of this vaccination. Routine delivery of HPV vaccine at ages 11-12 promotes vaccination prior to potential exposures and at an age where the antibody response is robust. Misperceptions among both parents and clinicians that HPV vaccination contributes to sexual promiscuity may also represent a barrier to conversations during office visits.

While it is unclear to what extent adolescents drive HPV vaccination, they may have knowledge deficits similar to their parents regarding awareness of the cancer prevention aspects of HPV vaccines, the general burden of HPV-related disease and HPV as a ubiquitous infection. Our findings indicate that schools are viewed as a potential platform for educating adolescents on these topics. Moreover, parents felt that clinicians should spend more time providing information about the HPV vaccine while clinicians wanted parents to be more knowledgeable about HPV and HPV vaccines when they present in medical offices. Accordingly, school-based educational programs may be an important platform for increasing knowledge and acceptance of HPV vaccine as well as garnering support for school-based vaccination [20].

It is important to acknowledge that our clinician sample included more health care professionals affiliated with family medicine versus pediatric offices; pediatricians are generally more effective in delivering adolescent vaccines [20]. However, this may help to better understand reasons for these differences. Our clinician sample also included a large proportion of females, who may be more likely to offer HPV vaccine than their male counterparts [20]. Due to differences in data collection methods, we had less robust data from our parent sample. Clinicians were able to offer more detail and depth of responses due to the use of open-ended interviewer administered questions, whereas parents completed a self-administered survey. Finally, both the clinician and parent samples had limited racial diversity, which may limit generalizability.

This paper adds to the existing literature by reporting on strategies for overcoming barriers to increase HPV vaccination as expressed by clinicians and by parents. The primary findings from this study affirm the need to address misperceptions and educational gaps on HPV among both clinicians and parents as key strategies to increasing uptake of HPV vaccination. The messaging for each group will need to be tailored but complementary in the themes addressed. Parents desire more information concerning HPV disease burden and vaccine effectiveness and safety while clinicians need further education regarding the urgency and importance of HPV vaccination, training on how to effectively communicate a strong, clear recommendation for HPV vaccination and ways to optimize office systems to support this. Finally, clinicians desire that patients and parents receive HPV vaccine information external to the medical practice and endorsed school-based education programs as a potential solution. Further dialogue emphasizing the cancer prevention potential of HPV vaccination, along with systems-based approaches including use of standard orders, will support increased vaccination rates for the HPV vaccine, which remains underutilized relative to other adolescent vaccines.



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**Table 1**

Demographics Characteristics of Interview and Survey Participants

	Interview Participants (Clinicians=52)		Survey Participants (Parents=54)	
		n (%)		n (%)
<b>Gender</b>				
Female		39 (75.0)		45 (83.3)
Male		13 (25.0)		5 (9.3)
Decline/Missing		-		4 (7.4)
<b>Age</b>				
18-30		1 (1.9)		3 (5.6)
31-40		4 (7.7)		26 (48.1)
41-50		17 (32.7)		18 (33.3)
51-60		22 (42.3)		4 (7.4)
>60		8 (15.4)		1 (1.9)
Missing				2 (3.7)
<b>Race/Ethnicity</b>				
Non-Hispanic White/Caucasian		45 (86.5)		47 (87.0)
Hispanic/White		1 (1.9)		-
Black		2 (3.8)		1 (1.9)
AI/AN		2 (3.8)		1 (1.9)
Asian		2 (3.8)		2 (3.7)
Mixed		-		1 (1.9)
Decline/Missing		1 (1.9)		2 (3.7)

Table 2

Responses by Clinicians to open-ended item asking, "What are the educational needs around HPV vaccine for each of the following target groups?"

Target Group	Themes	Sample Quotes	# of References
Physicians/Nurse Practitioners/Physician Assistants	Provider patient communication - patient education techniques	"...(clinician) recommendation is the single best predictor of vaccine." MD "They need better education on ways to get away from sex and focus on cancer. More straightforward. Act as the authority..." RN	14
	General vaccine education	"Many providers don't understand that this is a routine vaccine for 11-12 year olds." MD "Recommend an annual in service. If you don't use it you lose it." LPN	14
	Risks, side effects, safety	"Vaccine education, go over side effects profile, decrease fear of vaccine..." MD	12
	Conferences, grand rounds, CMEs, "keep up with the literature"	"More speaking about importance at primary care meetings and conferences. No mailings." MD "...they need to keep up with the literature. Meetings, societies, physicians teaching their own staff..." MD	9
	HPV Vaccine - general awareness/side effects/safety/urgency	"More in depth knowledge about what goals of vaccination is." MD "... (they are) first line people. Patients think everyone is a nurse. Basic education for them." RN	15
Nurses/Allied Health Staff	Patient communication - team approach	"More tools for education communicating, how to discuss it. Simple format, don't use lots of medical speak." MD "...promotion of all vaccines needs to be a team effort. Careful attention to words, team approach..." MD	14
	HPV general education/burden of disease	"Nurses don't need to get down to science, should know current diseases and side effects." MD "Need to know what HPV is and how to prevent it. Should promote vaccine." NP	11
	Current recommendations	"Knowledge of vaccine is for, risks, benefits, schedule." NP "Need to be updated when new stuff comes up. A refresher is good." LPN	10
	Efficacy/Benefit/Importance of vaccine	"People die from cervical cancer and it's totally preventable..." MD "Importance of immunity, not linking sexual activity to vaccine." RN	17
	Prevention of HPV and cancer	"...this STI can't be avoided but this reduces the risk of invasive cancer." MD "Benefits of vaccine as to what is getting prevented – not just STDs." MD	15
Parents	Risks, side effects, safety	"Safety, effectiveness. Access to online educational materials in school and doctor's offices." NP "Understand what it's for, real risks and benefits. Dispel myths." NP	13
	Pre-vaccine education	"What the vaccine does or doesn't do. Perhaps direct-to-consumer advertising." MD	11

Target Group	Themes	Sample Quotes	# of References*
Adolescents		"Reliable sources of information, a lot just look at whatever is online. Lack of trust for government websites. Would believe another parent." RN	
	Cancer prevention, HPV prevention, burden of disease	"...it's a way to keep yourself healthy and protect yourself against cancer..." RN "Patients who have had cervical cancer to share with kids about how horrible." MD "Disease prevention, plain and simple." RN "This is a real, serious infection. Face the fact that any sexually active woman will likely encounter..." MD	24
	Symptoms, warts, "use pictures"	"Should see more pics of genital warts. Motivated my own kids by comparing genital warts to plantar warts." MD "Need to talk to kids in language they understand. Speak to boys about penile cancer, warts, use pictures. Boys think they are safe." MD	10
	Education in schools	"Need more time for one-on-one counseling for proper info. Can more be done in schools?" MD "Work through school, health classes, sex ed classes..." (24) MD	8

\* Number of times mentioned; MD=Medical Doctor; PA=Physician Assistant; NP=Nurse Practitioner; RN=Registered Nurse; LPN=Licensed Practical Nurse

**Table 3**

Clinician and Parent Responses Regarding Adolescent Vaccines; Comparison of Likert Scale Items

		Respondent Group				p-value	
		Clinicians n=52		Parents n=54			
		<i>n</i>	%	<i>n</i>	%		
1.		<i>SA</i>	30	57.7	18	34.0	
		<i>A</i>	21	40.4	28	52.8	
	Promotional messages about the HPV vaccine should focus on cancer prevention.	<i>N</i>	1	1.9	7	13.2	.014
		<i>D</i>	-	-	-	-	
		<i>SD</i>	-	-	-	-	
		<i>n</i>	%	<i>n</i>	%		
2.		<i>SA</i>	1	1.9	2	3.8	
		<i>A</i>	6	11.5	5	9.4	
	Completion of HPV vaccination is more important than completion of Tdap vaccine.	<i>N</i>	26	50.0	27	50.9	.962
		<i>D</i>	16	30.8	15	28.3	
		<i>SD</i>	3	5.8	4	7.5	
		<i>n</i>	%	<i>n</i>	%		
3.		<i>SA</i>	2	4.0	1	2.0	
		<i>A</i>	15	29.4	5	9.8	
	Completion of HPV vaccination is more important than completion of MCV4.	<i>N</i>	20	39.2	30	58.8	.079
		<i>D</i>	13	25.5	12	23.5	
		<i>SD</i>	1	2.0	3	5.9	
		<i>n</i>	%	<i>n</i>	%		
4.		<i>SA</i>	24	46.2	17	32.1	
		<i>A</i>	25	48.1	25	47.2	
	HPV vaccine should be more actively promoted using TV ads.	<i>N</i>	2	3.8	10	18.9	.074
		<i>D</i>	-	-	1	1.9	
		<i>SD</i>	1	1.9			
		<i>n</i>	%	<i>n</i>	%		
5.		<i>SA</i>	22	42.3	15	28.3	
		<i>A</i>	23	44.2	28	52.8	
	HPV vaccine should be more actively promoted using magazine ads.	<i>N</i>	5	9.6	9	17.0	.350
		<i>D</i>	2	3.8	1	1.9	
		<i>SD</i>	-	-	-	-	
		<i>n</i>	%	<i>n</i>	%		
6.		<i>SA</i>	9	18.0	6	11.5	
		<i>A</i>	24	48.0	15	28.9	
	The HPV vaccine should be given to children ages 9-10 years.	<i>N</i>	8	16.0	21	40.4	.028
		<i>D</i>	9	18.0	7	13.5	
		<i>SD</i>	-	-	3	5.8	

SA=Strongly Agree; A=Agree; N=Neutral; D=Disagree; SD=Strongly Disagree; N/A=not applicable

\*Missing Data (Parent n=2; Clinicians n=2)

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