

# Primary care challenges and effort HPV vaccine: Review

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## Abstract

The present review was conducted to review the evidence in which HPV vaccination can be effective and monitored by family physicians in primary care. Four databases were selected to ensure a comprehensive review of the literature: PubMed, EMBASE, Ovid, and the Cochrane Review. On January 25, 2017, a total of 9 different queries were used for each engine: (1) “Human papillomavirus” (2) “Vaccine” (3) “Adolescent” (4) “Mixed methods research”. Addressing physicians' perceptions about parental acceptance of HPV vaccine, the possible advantages of discussing HPV vaccination with other recommended vaccines, and concerns about waning immunity could lead to increased vaccination rates. Moreover, physician education and evidence-based tools are needed to improve implementation of a vaccination program for males in primary care settings.

### • Introduction

Persistent human papillomavirus (HPV) infection is the main causal representative in cervical cancer <sup>[1]</sup> and also is responsible for a substantial percent of vulvar, vaginal, anal, penile, as well as oropharyngeal cancers as well as genital excrescences <sup>[2,3]</sup> Specific racial/ethnic teams are overmuch influenced by HPV-associated cancers. As an example, Latinos have higher occurrence of penile and

also cervical cancers cells compared to non-Latino whites, while African-Americans have higher incidence of cervical as well as vaginal cancers [2,4].

Highly efficient prophylactic HPV vaccinations have actually been available given that 2006 and are authorized for usage with teens as young as 9 years old [5-11]

Although the Advisory Board on Immunization Practices (ACIP) suggests routine vaccinations for teenagers [12,13], HPV injection uptake stays low [2,14] Across the country, 60% of adolescent girls and also 42% of adolescent kids aged 13-17 years have actually initiated the HPV vaccination, i.e., got! dose [15] Injection completion rates are substantially lower [15].

Robust prior research study has recognized a variety of patient-level aspects adding to variation in HPV vaccine uptake, consisting of HPV awareness, beliefs concerning vaccination, age, insurance gender, status, and race/ethnicity [16-23]

Research also indicates that healthcare service provider recommendation considerably affects vaccine uptake [24-27], but that suppliers differ in the consistency and quality of suggestions made [28-32].

Other healthcare group- and organization-level factors that may affect vaccine initiation and/or conclusion remain under- taken a look at in the literature. Especially in medical care practices supplying care under the patient-centered medical house model [33,34], group structure and operating might affect whether patients get recommended preventive care [35] Clinic-level policies and practices might also contribute. Little research has checked out the effect of such factors on HPV vaccine uptake.

The present review was conducted to review the evidence in which HPV vaccination can be effective and monitored by family physicians in primary care.

- **Methodology**

Four databases were selected to ensure a comprehensive review of the literature: PubMed, EMBASE, Ovid, and the Cochrane Review. On January 25, 2017, a total of 9 different queries were used for each engine: (1) “Human papillomavirus” (2) “Vaccine” (3) “Adolescent” (4) “Mixed methods research”. A hand search of the tables of contents of relevant journals published from January to December 2017 was then performed

## • Results and Discussion

### 3.1. Characteristics of adolescent patients aged 9–18 years

As shown in Table 1, approximately 31% of patients were 9-11 years, 29% were 12-14 years, and 40% were 15-18 years of ages. About half of patients were female; 83% were Latino. The majority (80%) got services covered by state funds. Around 74% were seen by a pediatrician.

Typically, less than half (45%) of patients initiated the HPV vaccine. Initiation rates were greatest (62%) among 15-18 year olds. Around 52% of patients who started the vaccine completed the vaccine series. Logistic regression results indicated that compared with Latinos, racial/ethnic groups aside from Asians and Pacific Islanders were less likely to start or finish the vaccine (Table 2). Uninsured patients were less likely to start the vaccine than those covered by Medicaid handled care; patients covered by Medicaid fee-for-service had lower odds of vaccine completion. Patients seen by service providers not focusing on pediatrics were likewise less most likely to start or complete the vaccine.

**Table1:** Characteristics of adolescent patients aged 9–18 years (n = 38,277).

	<b>Total (N = 38,277) n (%)</b>	<b>% initiating HPV vaccine (at least 1 dose) (%)</b>	<b>% completing HPV vaccine (after initiating) (%)</b>
<b>Age</b>			
9–11 years	11,823 (31%)	7	20
12–14 years	11,290 (29%)	61	41
15–18 years	15,164 (40%)	63	62
<b>Gender</b>			
Male	19,064 (50%)	42	43
Female	19,213 (50%)	48	59
<b>Race/ethnicity</b>			
Latino	31,888 (83%)	47	52
Non-Latino white	2668 (7%)	30	46
African American	1048 (3%)	35	42
Asian or Pacific	1218 (3%)	44	49
Islander	1450 (4%)	36	44
Other			
<b>Insurance</b>			
Medicaid HMO	19,680 (51%)	47	55
CHDP Program	7203 (19%)	53	50

<b>Medicaid FFS</b>	3778 (10%)	43	41
<b>Other HMO</b>	2978 (8%)	42	50

### *3.2. Characteristics of participating clinics and interview participants*

Vaccine uptake differed considerably throughout clinics. Four clinics that jointly accounted for one-third of teen patients were chosen for in-depth case study analysis. Average HPV vaccination uptake varied from 35-42% in the lower carrying out clinics and from 51-65% in the greater carrying out centers.

Demographic attributes of interview individuals are provided in Table 3. Interviews consisted of around 20% of eligible providers (doctors and nurse practitioners). Support personnel working directly with providers in our sample, e.g., medical assistants (MAs) or certified occupation nurses (LVNs), were also talked to. Major themes in each interview domain are summarized in Table 4.

**Table 2:** Logistic regression results: Patient characteristics associated with HPV vaccine uptake.

	<b>HPV vaccine initiation, (n = 38,277)</b>	<b>HPV vaccine completion (among those initiating) (n = 17,278)</b>
	OR (S.E.)	95% CI
<b>Age in years</b>	1.52* (0.03)	1.47–1.58
<b>Male Gender</b>	0.75* (0.03)	0.70–0.80

<b>Race/ethnicity</b>				
<b>Latino (referent)</b>	0.41* (0.05)	0.33–0.53	0.73* (0.04)	0.65–0.82
<b>Non-Latino white</b>	0.50* (0.05)	0.41–0.60	0.69* (0.09)	0.53–0.89
<b>African American</b>	0.80 (0.09)	0.64–1.01	0.98 (0.15)	0.73–1.32
<b>Asian or Pacific Islander</b>	0.59* (0.05)	0.50–0.70	0.74* (0.06)	0.63–0.87

### *3.3. Qualitative results by theme*

#### *3.3.1. Strategic priorities*

Individuals' perceptions of top concern concerns in the patient population varied by company specialized. Almost all pediatricians and their assistance personnel determined avoidance as a leading priority. As one participant noted, "We remain in business of preventive care, and the HPV vaccine, it's quite about avoidance." By contrast, family medicine specialists and their personnel concurred that avoidance was essential, but prioritized management of persistent conditions such as diabetes and hypertension. One medical director indicated that this difference in priority-setting affected uptake of all vaccines, not just HPV: "In the pediatric

groups it's [vaccination] hard wired ... I need to deal with family medicine ... since I have no idea how good they are about giving vaccinations."

When asked particularly about the HPV vaccine, 63% of individuals in higher performing centers recognized HPV vaccination as a high priority compared with just 36% of individuals in lower carrying out clinics. Participants that rated HPV vaccine as a medium or low concern did so due to the fact that they and/or their patients viewed the vaccine as optional ("It's not a school requirement type of vaccine") or due to the fact that eligible patients made up just a small percent-age of their panel.

**Table 3:** Demographic characteristics of interview participants (n = 36).

	N (%)
<b>Role</b>	14 (39%)
<b>Provider</b>	17 (47%)
<b>Support staff</b>	5 (14%)
<b>Senior leader</b>	8 (22%)
<b>Male gender</b>	20 (56%)
<b>Race/ethnicity</b>	
<b>Hispanic/Latino</b>	9 (25%)
<b>Asian or Pacific Islander</b>	4 (11%)

### ***3.3.2. Organizational context***

Participants in all 4 clinics recognized strong, system-level supports for vaccination. The most regularly pointed out supports included a sophisticated EHR system with a vaccine template, a designated immunization champion in each center, and a robust efficiency management system consisting of regular monthly

review of center performance on FQHC-designated performance metrics and monetary rewards for companies. Individuals described these assistances as handy at focusing attention on immunization rates. Because HPV vaccination was not presently an FQHC- designated performance metric, clinics differed in the level to which HPV vaccination was discussed during monthly meetings. Center leaders described that FQHC-designated metrics were lined up with HEDIS steps, which at the time did not include HPV vaccination.

Participants likewise determined two significant areas for improvement. Since patient visits might just be arranged three months in advance, patients were positioned on a recall list rather than scheduled for the last dose at the time of the visit. Individuals noted that recall lists were not constantly reliable with their patient population since "their phone number turnover is quick ... A lot of times the phone numbers are altered." Individuals likewise felt they had no external incentives to proactively set up patients for follow-up dosages. Unless patients were already returning for another reason, return geos to for vaccination were treated as unscheduled sees and squeezed in between other visits, resulting in prolonged wait times. Several individuals likewise noted that patients had little inspiration to return for a vaccine "not compulsory for school."

### ***3.3.3. Care team structure and functioning***

In all clinics, care groups were consisted of a provider supported by 2 MAs. All centers also had at least one LVN available to supervise MAs and provide additional assistance. All MAs helped room patients, take vital signs, and administer vaccines purchased by the service provider; other MA obligations varied throughout centers and teams.



Individuals from greater carrying out clinics usually described vaccination as a team effort ("It takes an entire clinic to do their part in capturing patients that are not vaccinated"), while individuals in lower carrying out clinics had the tendency to determine vaccination as the supplier's duty. Participants that perceived vaccination as a team effort also reported high levels of MA assistance in promoting vaccination. By contrast, participants coming from teams where vaccination was deemed the service provider's duty described minimal MA participation in promoting vaccination: "The provider orders vaccines ... Depending upon exactly what it is, we go get them."

#### **3.3.4. Knowledge, attitudes, and beliefs: provider and staff**

All suppliers, even those who did not identify HPV vaccination as a high clinical top priority, reported positive mindsets towards the vaccine. Assistance staff mindsets were more blended, with some participants expressing hesitation about vaccine effectiveness and numerous age-eligible staff noting they had actually not personally chosen to be immunized. Support personnel attitudes did not vary systematically by center.

With regards to knowledge about the HPV vaccine, several providers noted that often changing guidelines made it hard to remain updated. At the time the interviews were conducted, a nonavalent HPV vaccine had just been launched; nevertheless, not all providers were aware the vaccine existed or that it was being stocked by the FQHC. Service providers were likewise unclear on guide-lines for administering the vaccine to patients who had actually formerly received a dose of the quadrivalent vaccine.

### ***3.3.5. Knowledge, attitudes, and beliefs: Patient and/or parents***

Almost all participants felt that parents' knowledge of the HPV vaccine was restricted (" 8 to 10 on a scale of 0-10000 ). Suppliers in lower carrying out centers were more likely to recognize patient false information about the HPV vaccine as a barrier to vaccine initiation (" They [parents] hear stuff in the street and ... don't want to get it for their kids"). In all clinics, parental concerns about HPV vaccination being associated with sex were described as a barrier to vaccine initiation (" It will provide a license to be sexually active since they feel like they can't get any of those bad diseases"). Perceptions of the vaccine as avoiding cervical cancer were likewise referred to as adding to resistance to vaccination among parents of kids. In general, however, service providers and staff identified adult understanding, attitudes, and beliefs as barriers to vaccine initiation, however not to vaccine conclusion. As one company discussed, "Once we get consent for the very first one, it's not a problem to move on with the full set. It's more of a logistical issue after that."

### ***3.3.6. Communication with patients and parents about the HPV vaccine***

Support staff in all centers were responsible for informing patients about needed preventive care in advance of the provider encounter and therefore, typically functioned as the patient's first point of contact regarding the HPV vaccine. Support personnel communication about the HPV vaccine was highly variable: Some provided the vaccine as optional or deferred thorough discussion to the service provider, while others actively promoted vaccine advantages to patients. In addition, lots of support staff reported being requested their personal viewpoint about the HPV vaccine ("The medical professional said I require this vaccine, what do you think?"). Concerns about being viewed as providing medical recommendations suggested MAs beware in their reactions; however, support

personnel in higher performing clinics still reported enhancing supplier messaging related to the vaccine ("I can not persuade you to do it, however as a moms and dad, I would do it for my kid").

When communicating with patients about the vaccine, almost all suppliers reported emphasizing the vaccine's cancer prevention benefits. A handful of providers tailored their messaging based on patient gender ("With the males, I do not say cervical cancer. I say genital warts,"). Suppliers agreed that it was most convenient to provide the HPV vaccine as part of the teen vaccine series. Companies in higher performing centers had the tendency to explain the vaccine as recommended and not to supply additional details unless asked ("We don't even have the conversation that this is the only shot that's not needed. No. These are the shots that the child needs for seventh grade").

**Table 4:** Factors affecting HPV vaccination rates: Summary of qualitative results by interview domain.

Interview domain	Relevant themes
<p><b>Strategic priorities</b></p>	<ul style="list-style-type: none"> <li>-Pediatricians identified preventive care as a top priority, but family medicine practitioners prioritized management of chronic conditions (e.g., diabetes, hypertension)</li> <li>-63% of participants in higher performing clinics identified HPV vaccination as a ‘‘high’’ priority for their clinic compared to 36% of participants in lower performing clinics</li> </ul>
<p><b>Organizational context (e.g., vaccination policies and procedures, system-level supports, performance management system)</b></p>	<ul style="list-style-type: none"> <li>-Support: Sophisticated electronic health record that includes a vaccine template, but no auto- matic alert or reminder for when vaccines are due</li> <li>-Support: Clinics have Vaccine Information Sheets (VIS) available that providers and staff can distribute to patients and parents. The VIS recommends first HPV dose at age 11–12 years</li> <li>-Support: Designated immunization champion</li> </ul>

	<p>in each clinic responsible for reviewing clinic-level performance with support staff</p>
<p><b>Care team structure and functioning</b></p>	<p>-Care team typically comprised of 1 provider supported by 2 MAs. MAs predominantly Latino and from local community                  -Significant variation across teams in extent to which MAs support providers by reviewing patient preventive care needs and preparing patients and/or parents for provider encounter                  -Part-time providers often assigned ‘floats’ or different MAs each time in clinic, which negatively affects willingness to rely on MAs for support</p>
<p><b>Knowledge, attitudes, and beliefs: Provider and staff</b></p>	<p>-All providers expressed positive attitudes about the HPV vaccine. Support staff attitudes towards the vaccine were more mixed                  -Providers varied in whether aware of minimum age requirements for the HPV vaccine (9 instead of 11) or of the nonavalent HPV vaccine. Support staff knowledge of the vaccine was typically quite limited</p>
<p><b>Knowledge, attitudes, and beliefs: Patient and parents</b></p>	<p>-Significant misinformation about the HPV vaccine within local community, especially about efficacy, benefits, and risks, can affect patient and parent willingness to initiate HPV vaccine --Perception of HPV vaccine as preventing sexually transmitted infection can generate resistance to vaccination among parents reluctant to discuss or appear to condone sexual activity ---Perception of HPV vaccine as “for girls” can make adolescent males and their parents more reluctant to vaccinate</p>
<p><b>Communication with patients and parents about the HPV vaccine</b></p>	<p>-Significant variation in whether and how providers and staff discuss HPV vaccine with patients (e.g., whether vaccine presented as ‘optional’ vs. as another component of the adolescent vaccine series, whether described as preventing HPV vs. preventing cervical</p>

	cancer and genital warts, etc.) -Participants from pediatrics emphasized ‘bundling’ HPV vaccine as part of the typical vaccination series for adolescents
<b>Desired supports and/or resources</b>	-Dedicated staff to call patients due for preventive care -Educational materials (e.g., pamphlets or posters) that reinforce information provided during face-to-face visit. Effective materials should be colorful, easy for patients to understand, and available in multiple languages

### ***3.3.7. Desired supports and/or resources***

When asked to identify resources helpful for facilitating vaccine uptake, providers most frequently emphasized the need for staff time dedicated to panel management activities (“to have someone review the chart and check who is behind [on vaccines], and have that person assigned to call and bring patients in to get caught up.”) Providers and staff acknowledged that staff were technically already responsible for panel management; however, these activities were often perceived as an “extra chore,” and “at the bottom of the priority list.” Dedicated time for staff to speak with patients about preventive care was perceived as important to ensuring such activities actually occurred.

Participants also expressed the need for information provided during the visit to be reinforced by other sources. Support staff preferred educational materials that patients could take home, e.g., colorful brochures that were easy to understand and available in multiple languages. Providers identified outreach by peers and public education as important for changing knowledge, attitudes, and beliefs about the

vaccine. Finally, several respondents indicated a need for training on how to best discuss the HPV vaccine with patients and their parents.

#### **4. Discussion**

Robust literature suggests that supplier suggestion affects HPV vaccine receipt [32,38,39]; nevertheless, relatively little research has actually dealt with other care group and clinic-level elements that may impact vaccine uptake. This research study adds to the literature by analyzing multilevel factors impacting HPV vaccine uptake in a large FQHC serving primarily low-income and ethnic minority patients.

Quantitative findings exposed substantial variation in vaccine uptake across centers. Qualitative interviews with service providers and personnel identified numerous factors at the healthcare group and center levels perceived as affecting vaccine uptake. In particular, findings highlighted the crucial role that support staff can play in promoting vaccine uptake. For example, findings indicated that MAs in higher carrying out centers spent more time reviewing patient preventive care needs and preparing patients and parents for the company encounter. These findings follow research study on changes in medical care practices under the patient-centered medical house model, which suggest a broadened role for assistance staff in patient education and panel management [33,34,40]. In our research study, MA assistance was mainly limited to the patient visit. Staff were motivated to proactively reach out and remind patients about needed preventive care; however, completing top priorities and time constraints avoided most from doing so. These outcomes are consistent with prior research explaining expense and insufficient staff time as significant barriers to implementing patient pointers [41,42]

Differences in degree to which MAs enhanced supplier vaccine recommendations might likewise impact vaccine uptake. Lots of MAs reported being requested for their individual viewpoint about the HPV vaccine. In numerous FQHCs, support personnel are likewise lay members of the neighborhoods being served<sup>[43]</sup>; as such, they can play a vital function in enhancing patient trust and in ensuring arrangement of bilingual and/or culturally competent care<sup>[44,45]</sup>. In our sample, MA attitudes and beliefs about the vaccine were combined. Only one MA reported taking part in training on ways to best present the HPV vaccine to patients, recommending the need for additional personnel training in this area. Future research might explore in more information how these and other team-level aspects affect vaccine uptake.

Consistent with prior research, findings also suggest that distinctions in provider and personnel knowledge and communication techniques can affect vaccine initiation<sup>[46,47]</sup>. Strategies such as combining the HPV vaccine with several co-vaccines and emphasizing vaccine benefits were determined as crucial for boosting vaccine initiation<sup>[48,49]</sup>. Companies and staff were less clear on how to resolve parental misinformation, recommending the need for extra training in this area.

Center use of efficiency scheduling, management, and reminder systems were recognized by respondents as playing a more vital function than patient-level consider making sure vaccine conclusion. Discussion of vaccine performance metrics during monthly center conferences and proactive involvement of immunization champions were described as vital to cultivating an organizational climate supportive of vaccination. Other system-level factors such as scheduling and reminder systems were likewise recognized as crucial, mostly because of their impact on provider/staff efforts to ensure vaccine completion. Many critically,

reminders alone were referred to as insufficient for enhancing vaccine uptake; rather, study findings recommend the need to target elements at multiple levels of influence.

Several constraints should be thought about in interpreting research study outcomes. First, we used aggregated clinic-level information to designate individuals to higher vs. lower performing groups. This method was useful in recognizing clinic-level aspects that may impact vaccine uptake, but minimal our capability to directly link group structures and processes to distinctions in vaccine uptake. Second, our interview sample only included clinics offering care to a large number of age-eligible teenagers. Clinics supplying care to small numbers of age-eligible teenagers may face additional difficulties not reflected in the present study. This research study does not consist of patient viewpoints on aspects affecting vaccine uptake.

### • *Conclusion*

Many studies reporting that the family physicians experiencing parental deferment of HPV injection for their 11- to 12-year-old clients, and also this assumption of deferral could create them to prevent reviewing the HPV injection. Recurring public health efforts may advertise favorable parental perspectives about the HPV vaccination and also reduce physicians' experience with parental deferral. Dealing with doctors' assumptions about adult acceptance



of HPV vaccination, the possible benefits of talking about HPV inoculation with various other recommended vaccinations, as well as problems about subsiding immunity could result in enhanced inoculation rates.

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