

# HPV Vaccination for Boys and Young Men: Addressing Misconceptions and Expanding Uptake

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Human papillomavirus (HPV) is among the most common sexually transmitted infections in the United States.<sup>1</sup> The Centers for Disease Control and Prevention estimates that most sexually active men and women will contract HPV at some point in their lives.

Although most cases of HPV resolve on their own, several HPV types are causally associated with genital warts and cervical cancer.<sup>1-3</sup> High-risk HPV types are also causally linked with anal, penile, and oropharyngeal cancers. An estimated 75% to 95% of anal cancers in men and women,<sup>2,4,5</sup> and 40% to 50% of penile cancers are caused by high-risk HPV types.<sup>2,5</sup> Men as well as women experience a substantial disease burden associated with HPV infection. Mounting evidence in the case of oral HPV infection indicates that HPV has replaced tobacco as the primary cause of oropharyngeal cancer,<sup>6</sup> with 4-fold higher oropharyngeal cancer incidence in the United States among men than women.<sup>7</sup>

## HPV Prevention and Treatment

HPV vaccines are safe and highly efficacious in both boys<sup>1,8</sup> and girls.<sup>1,3</sup> Building on its earlier recommendations for routine use of the bivalent HPV (HPV2) or quadrivalent HPV (HPV4) vaccine for girls, in 2011 the Advisory Committee on Immunization Practices (ACIP) recommended the HPV4 vaccine for routine vaccination of boys aged 11 or 12 years to prevent genital warts and HPV-associated cancers.<sup>9</sup> The HPV4 vaccine is also recommended for unvaccinated adolescent boys and men aged 13 to 21 years, as well as for men who have sex with men and immunocompromised patients aged  $\leq 26$  years who are at disproportionate risk for HPV infection and associated cancers.<sup>10</sup> HPV4 has demonstrated >90% efficacy in preventing the incidence of external genital lesions associated with HPV 6, 11, 16, or 18 in boys and men aged 16 to 26 years.<sup>8</sup> Most recently, a 9-valent HPV (HPV9) vaccine was licensed by the US Food and Drug Administration and included by ACIP as 1 of 2 HPV vaccines that can be used for routine vaccination of boys.<sup>10</sup>

Despite ACIP recommendations, HPV vaccine coverage in the United States remains well below public health targets. In 2013, 3-dose HPV vaccine coverage was 37.6% for girls and 13.9% for boys in the United States.<sup>9</sup>

## Factors Associated with Low HPV Vaccination Rates

Because of the low rates of HPV vaccine coverage—particularly among boys and young men—it is important to identify factors associated with uptake, as well as missed opportunities for HPV vaccine administration. Among the most influential factors, perceived benefit of HPV vaccination strongly correlates with acceptability among men.<sup>11</sup> Importantly, a significant barrier to HPV vaccinations for men is an enduring belief—including among boys/young men and their parents—that HPV is a woman's disease.<sup>12</sup>

Another highly influential factor in HPV vaccine coverage is healthcare provider recommendation.<sup>11</sup> A national survey in the United States revealed that more than one-fifth of parents reported that the main reason that their boys did not receive the HPV4 vaccine was because of a lack of recommendation from their clinician: 72% of parents of vaccinated boys reported receiving recommendations from their clinician, while only 26% of parents of unvaccinated boys reported receiving a clinician's recommendation.<sup>9</sup> Amid an increase in reported clinician recommendations for HPV vaccines documented from 2012 to 2013, parents of girls were still 50% more likely to report receiving a recommendation compared with parents of boys.<sup>9</sup> Thus, it appears that clinicians may be subject to the same lingering misconceptions revealed among parents and young men: the belief that HPV is a woman's disease.

An additional barrier is that parents appear more likely to vaccinate older versus younger children against HPV, particularly among girls; however, this is counter to ACIP recommendations that the vaccine be administered at age 11 or 12 years, prior to sexual debut, to optimize its effectiveness. Although parents' understandable difficulty envisioning their children as eventually becoming sexually active is sometimes reported as a barrier to receiving the HPV vaccine—as is the less common concern that vaccination will somehow encourage children to engage in earlier sexual debut—it appears that most parents' primary focus is on protecting their children from harm. Parents' lack of awareness of the risks of HPV for boys, coupled with lack of knowledge about the HPV4 vaccine and the absence of clinician recommendations, contribute to missed opportunities for receipt of HPV4 vaccines among boys and young men.<sup>9</sup>

## Addressing Barriers to HPV Vaccination of Boys and Young Men

The challenges identified to HPV vaccination of boys and young men span multiple levels, from individual knowledge and perceptions about HPV risk and HPV vaccine benefits for men, to parental concerns about HPV vaccination, to lack of healthcare provider recommendation. However, each of these factors may be mitigated, in part, by promoting a singular focal message: HPV vaccines help to prevent multiple cancers in both men and women. Emerging evidence suggests that a balanced approach to sharing this information, characterized by transparency and completeness—such as imparting that most HPV types are not oncogenic and are cleared from the system, versus appearing to erroneously suggest that all HPV infection leads to cancer—may be most effective in improving knowledge of HPV risk and HPV vaccines; it also results in a greater likelihood that reported intentions to be vaccinated result in actual vaccination.<sup>13</sup>

It is also incumbent on those engaged across the spectrum of patient care to correct the misperception that HPV vaccination is not for boys. This may be achieved by making parents aware of the risks of HPV for boys and men, sharing information about the high efficacy and safety of the HPV4 and HPV9 vaccines, and highlighting the unique availability of a vaccine that contributes to cancer prevention in men and women.

In addition to the direct benefits of HPV vaccination for boys and men, because of the suboptimal HPV vaccine coverage among girls and young women in the United States, vaccinating boys contributes to herd immunity, and thereby preventing HPV in girls, too. Appeals for both self-protection and altruism may contribute to parents' and children's acceptance of the vaccine.<sup>14</sup>

## HPV Vaccine Cost Concerns

Importantly, the relatively high cost of HPV vaccination (\$130/dose for 3 doses),<sup>15</sup> in addition to logistic barriers, also presents substantial obstacles to HPV vaccination for both boys and girls. Increased HPV knowledge and awareness across young people, parents, and clinicians, although important, may not be sufficient to achieve widespread coverage.<sup>16</sup> Expanding points of HPV vaccine access and reducing logistic barriers (eg, travel and waiting times) may make a further contribution to HPV vaccine uptake.

Ultimately, emerging evidence of the noninferiority of 2-dose coverage<sup>17-19</sup> along with further efforts to reduce the costs of HPV vaccines and provide universal public insurance coverage for routine HPV vaccinations, may make the most substantial contribution to ensuring high rates of HPV vaccine coverage in boys as well as girls.<sup>16</sup> In turn, we may make the most effective use of this unique opportunity to advance cancer prevention.

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