

You are the Key to HPV Cancer Prevention

Understanding the Burden of HPV Disease,
the Importance of the HPV Vaccine Recommendation,
and Communicating about HPV Vaccination

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Disclosure

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



Summary

- ▶ *Not enough children are being vaccinated to prevent HPV-related cancers in adulthood.*

- ▶ *From a public health standpoint, we are missing opportunities to prevent substantial mortality, morbidity, and healthcare costs caused by HPV-related diseases.*



Objectives

- 1. Define the importance of HPV vaccination for cancer prevention and the rationale for vaccinating children aged 11 or 12 years**
- 2. List the indications for HPV vaccine for males and females**
- 3. Provide useful and compelling information about HPV vaccine to parents to aid in making the decision to vaccinate**
- 4. Locate resources relevant to current immunization practice**



Understanding the Burden

HPV INFECTION & DISEASE



HPV Types Differ in their Disease Associations

~40 Types

Mucosal sites of infection

Cutaneous sites of infection

~ 80 Types

High risk (oncogenic)
HPV 16, 18

Low risk (non-oncogenic)
HPV 6, 11

Cervical Cancer
Anogenital Cancers
Oropharyngeal Cancer
Cancer Precursors
Low Grade Cervical Disease

Genital Warts
Laryngeal Papillomas
Low Grade Cervical Disease

“Common”
Hand and Foot
Warts



HPV Infection

- ▶ **Majority of females and males will be infected with at least one type of HPV**
 - ▶ ~79 million persons infected in United States
 - ▶ 14 million new infections/year in United States
 - ▶ HPV infection most common in teens and early 20s
- ▶ **Majority of persons asymptomatic**

Jemal A et al. J Natl Cancer Inst 2013;105:175-201



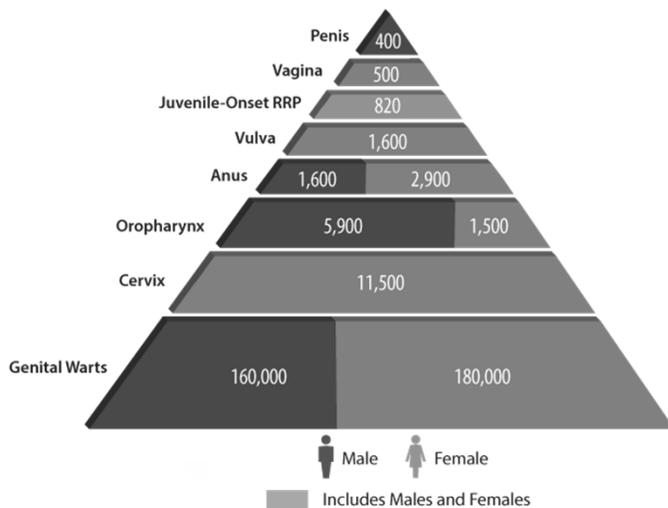
HPV Transmission

- ▶ **Almost everyone will be infected but most people will never know**
- ▶ **47% of high school students have already engaged in sexual (vaginal-penile) intercourse**
 - ▶ 6% of students had sexual intercourse before age 13
 - ▶ 1/3 of 9th graders and 2/3 of 12th graders have engaged in sexual intercourse
 - ▶ 1 in 7 high school students (all grades) have had sexual intercourse with 4 or more partners

Jemal A et al. J Natl Cancer Inst 2013;105:175-201
Kahn. MMWR. 2014; 63(4)



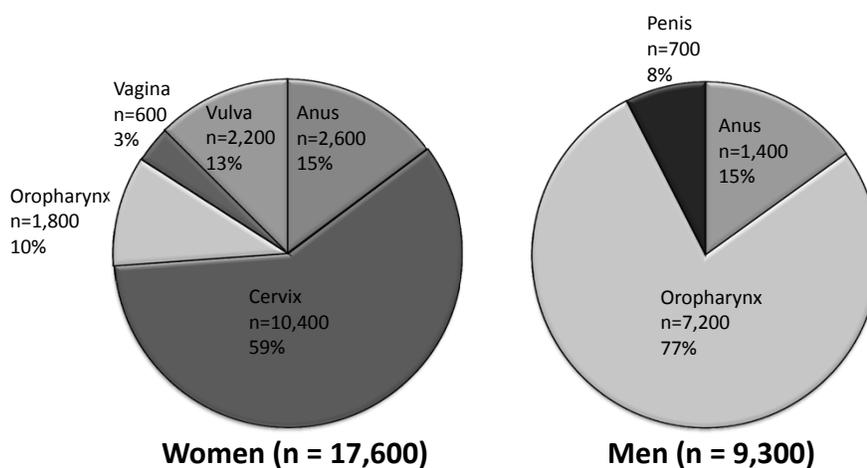
Annual Cases of HPV-related Cancers and Genital Warts in the United States



CDC. Human papillomavirus (HPV)-associated cancers. Atlanta, GA: US Department of Health and Human Services, CDC; 2013. Available at <http://www.cdc.gov/cancer/hpv/statistics/cases.htm>



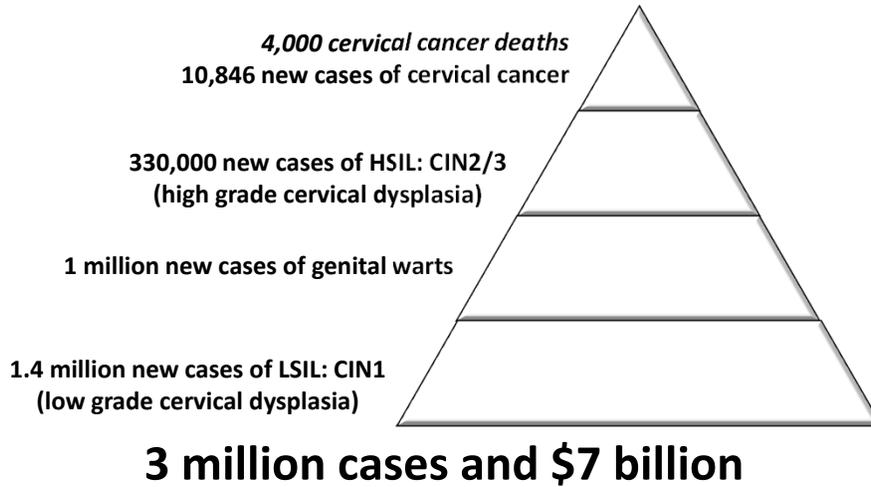
Average Number of New Cancers Probably Caused by HPV, by Sex, United States, 2006–2010



CDC. United States Cancer Statistics (USCS), 2006-2010



Without vaccination, annual burden of genital HPV-related disease in U.S. females:



American Cancer Society, 2008; Schiffman *Arch Pathol Lab Med.* 2003; Koshiol
Sex Transm Dis. 2004; Insinga, *Pharmacoeconomics*, 2005



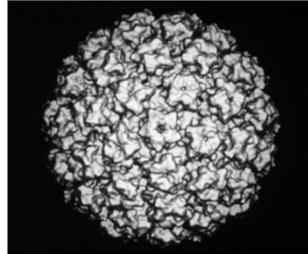
Evidence-Based HPV Prevention

HPV VACCINE



HPV Prophylactic Vaccines

- ▶ Recombinant L1 capsid proteins that form “virus-like” particles (VLP)
- ▶ Non-infectious and non-oncogenic
- ▶ Produce higher levels of neutralizing antibody than natural infection

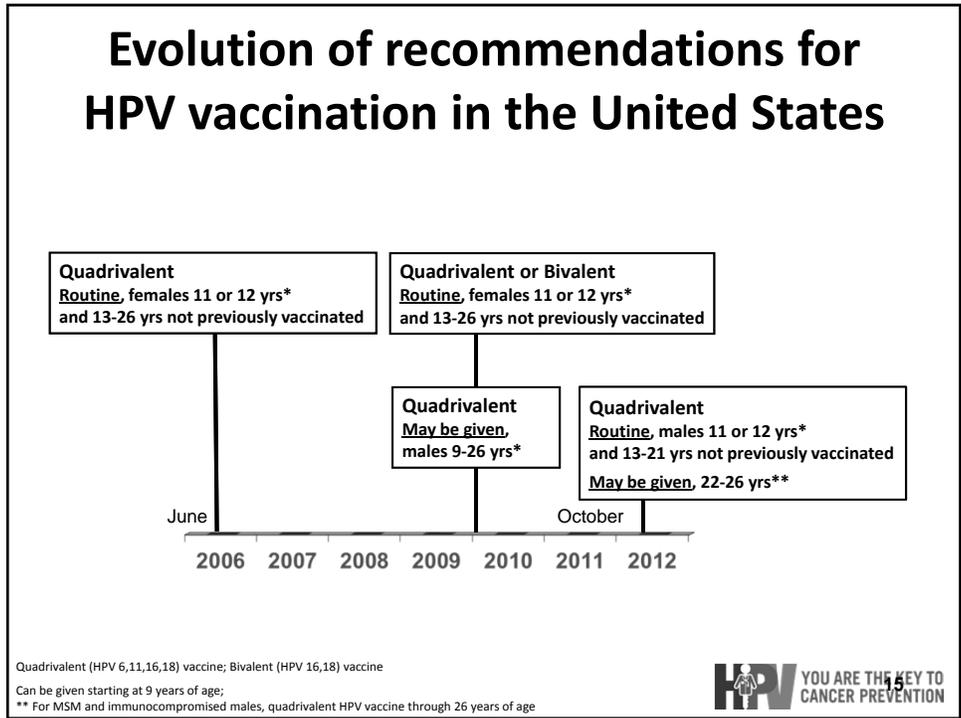


HPV Virus-Like Particle



Quadrivalent/HPV4 (Gardasil)	Name	Bivalent/HPV2 (Cervarix)
Merck	Manufacturer	GlaxoSmithKline
6, 11, 16, 18	Types	16, 18
Females: Anal, cervical, vaginal and vulvar precancer and cancer; Genital warts Males: Anal precancer and cancer; Genital warts	Indications	Females: Cervical precancer and cancer Males: Not approved for use in males
Hypersensitivity to yeast	Contraindications	Hypersensitivity to latex (latex only contained in pre-filled syringes, not single-dose vials)
3 dose series: 0, 2, 6 months	Schedule (IM)	3 dose series: 0, 1, 6 months





Quadrivalent/HPV9 (Gardasil 9)

- **FDA approved use of Gardasil 9 on December 10, 2014**

 - Prevention of cervical, vulvar, vaginal, and anal cancers caused by HPV types 16, 18, 31, 33, 45, 52, and 58, and for the prevention of genital warts caused by HPV types 6 and 11.
 - Females aged 9–26 years
 - Males aged 9–15 years

- **ACIP recommended use of HPV9 on February 26, 2015**

 - Females aged 9–26 years
 - Males aged 9–21 years
 - 3 doses: 0, 2, and 6 months

HPV YOU ARE THE KEY TO CANCER PREVENTION

HPV Vaccination Schedule

- ▶ ACIP recommended schedule is 0, 1-2*, 6 months
 - ▶ Following the recommended schedule is preferred
- ▶ Minimum intervals
 - ▶ 4 weeks between doses 1 and 2
 - ▶ 12 weeks between doses 2 and 3
 - ❖ 24 weeks between doses 1 and 3
- ▶ Administer IM

CDC. Quadrivalent Human Papillomavirus Vaccine: Recommendations of ACIP. MMWR 2007;56(RR02):1-24.



HPV VACCINE SAFETY



HPV4 Pre-licensure Studies

- ▶ **Safety data for 18,083 persons from 7 trials**
 - ▶ 8178 received HPV4

- ▶ **Most common adverse events:**
 - ▶ Pain, swelling, erythema at injection site

- ▶ **Vaccine-related serious adverse events in <0.1%**
 - ▶ Similar in vaccine and placebo groups

MMWR. 2014;63(no.5):1-30.



HPV Vaccine Safety Monitoring: VAERS

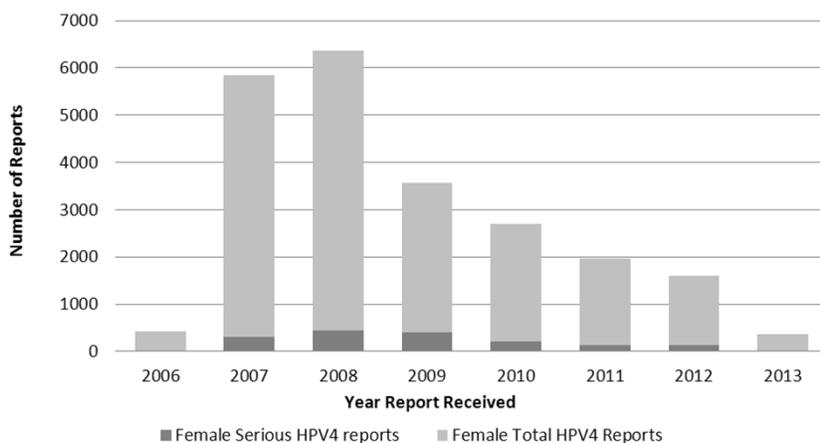
- ▶ **No new safety concerns have been identified in post-licensure vaccine safety surveillance among male or female recipients of HPV4 vaccine**
 - ▶ Among the 7.9% of reports coded as “serious”, most frequently cited are headache, nausea, vomiting, fatigue, dizziness, syncope, generalized weakness

- ▶ **Syncope continues to be a frequently reported adverse event following immunization among adolescents**
 - ▶ Adherence to a 15-minute observation period (sitting or supine) after vaccination is encouraged

<http://www.cdc.gov/vaccinesafety/vaccines/HPV/index.html#monitor>



Trends in Total and Serious Female HPV4 Vaccine Reports to VAERS by Year, June 2006 – March 2013 (N=21,194)



MMWR 2013;62:591-595



HPV Vaccine and Pregnancy

- ▶ **HPV4 and HPV2 Pregnancy Category B**
- ▶ **HPV vaccines should NOT be administered during pregnancy**
- ▶ **Pregnancy tests before HPV vaccine administration NOT recommended**
- ▶ **3,819 females receiving HPV4 and 3,696 females receiving HPV2 during pre-licensure studies reported pregnancy during trial**
- ▶ **Adverse pregnancy outcomes (SAB, major birth defects) not substantially different compared with unexposed control group**

MMWR. 2014;63(no.5):1-30.



HPV VACCINE IMPACT



HPV4 Pre-licensure Studies

► Females

- 4 clinical trials involving 20,000 females
- Per-protocol efficacy against HPV 16/18 related CIN2+ = 98.2%
- Intention to treat efficacy = 52%

► Males

- 1 clinical trial involving 4,065 males
- Per protocol efficacy against HPV 6/11 genital warts = 89.4%
- Intention to treat efficacy = 67.2%
- Sub-study of MSM, per protocol efficacy against AIN 2/3 = 74.9%

MMWR. 2014;63(no.5):1-30.



HPV2 Pre-licensure Studies

- ▶ **Phase III trial involving 18,644 females**
 - ▶ **Efficacy against HPV 16/18 CIN2+ = 94.9%**
 - ▶ **Intention to treat analysis = 60.7%**



HPV Vaccine Duration of Immunity

- ▶ **Studies suggest that vaccine protection is long-lasting; no evidence of waning immunity**
 - ▶ Available evidence indicates protection for at least 8-10 years
 - ▶ Multiple cohort studies are in progress to monitor the duration of immunity

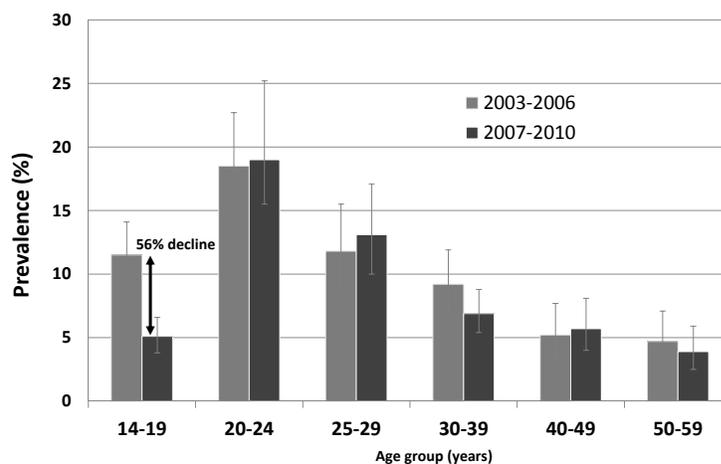
Romanowski B. Long term protection against cervical infection with the human papillomavirus: review of currently available vaccines. Hum Vaccin. 2011 Feb;7(2):161-9.



Monitoring Impact of HPV Vaccine Programs: HPV-associated Outcomes



Prevalence of HPV 6, 11, 16, 18* in Cervicovaginal Swabs, by Age Group, NHANES, 2003-2006 and 2007-2010, U.S.



*weighted prevalence
 Markowitz, et al. Reduction in HPV prevalence among young women following HPV vaccine introduction in the United States, NHANES, 2003-2010. J Infect Dis 2103



HPV Vaccine Impact: HPV Prevalence Studies, continued

► Clinic-Based Studies

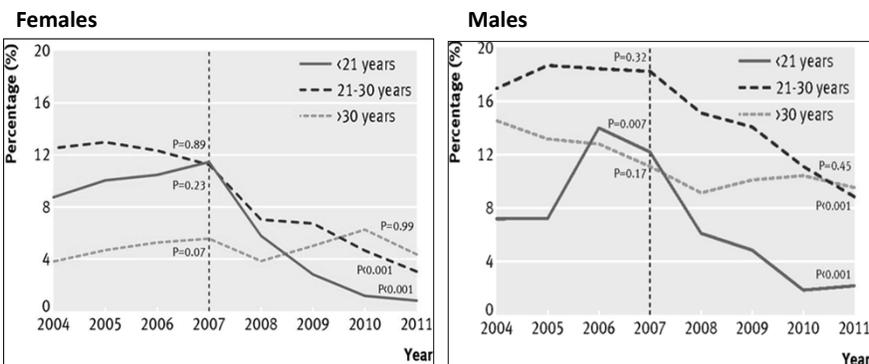
- Significant decrease from 24.0% to 5.3% in HPV vaccine type prevalence in at-risk sexually active females 14-17 years of age attending 3 urban primary care clinics from 1999-2005, compared to a similar group of women who attended the same 3 clinics in 2010
- Significant declines in vaccine type HPV prevalence in both vaccinated and unvaccinated women aged 13-26 years who attended primary care clinics from 2009-2010 compared to those from the pre-vaccine period (2006-2007)

Kahn JA, Brown DR, Ding L, et al. Vaccine-Type Human Papillomavirus and Evidence of Herd Protection After Vaccine Introduction. *Pediatrics*. 2012; 130:249-56.



Impact of HPV vaccination in Australia

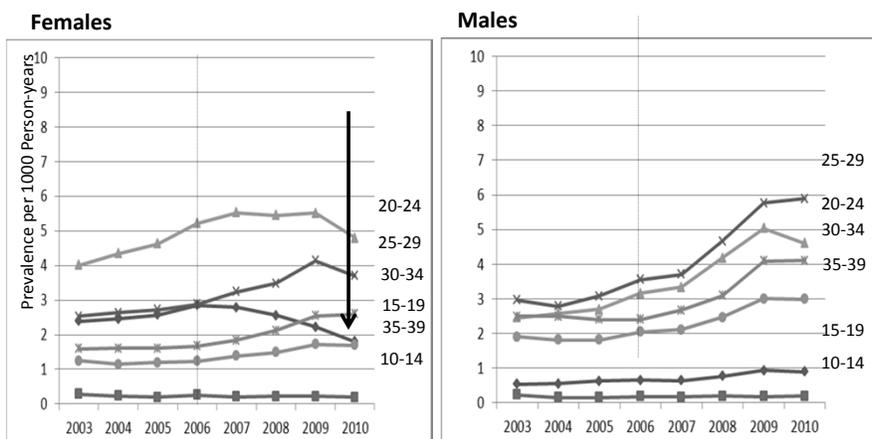
Proportion of Australian born females and males diagnosed as having genital warts at first visit, by age group, 2004-11



Ali, et al., Genital warts in young Australians five years into national human papillomavirus vaccination programme: national surveillance data. *British Med J* 2013;346:f2032



Anogenital Wart Prevalence per 1000 person-years, US Private Insurance Enrollees, by Age, 2003-2010



Flagg, et al. AJPH 2013



Impact of HPV Vaccine on HPV 16/18 Precancers

- ▶ **CIN2+ cases women 18 to 31 years of age were reported from pathology laboratories in 5 states from 2008 to 2011**
 - ▶ Of 5083 CIN2+ cases, 3855 had vaccination histories investigated, and 1900 had vaccine history documented
- ▶ **Among women with CIN2+ who had started HPV vaccine more than 24 months before their Pap smear, there was a significant reduction in HPV 16/18-related lesions**
 - ▶ These results suggest an early impact of the HPV vaccine on vaccine-type precancers

Powell S, et al, Impact of human papillomavirus (HPV) vaccination on HPV 16/18-related prevalence in precancerous cervical lesions. Vaccine 2012;31:109-113

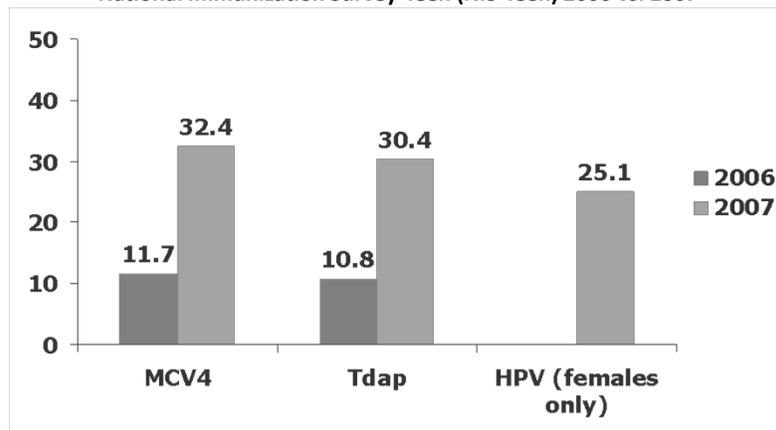


HPV VACCINE COVERAGE



Strong Start? Adolescent Vaccination Coverage, US 13-17 year olds

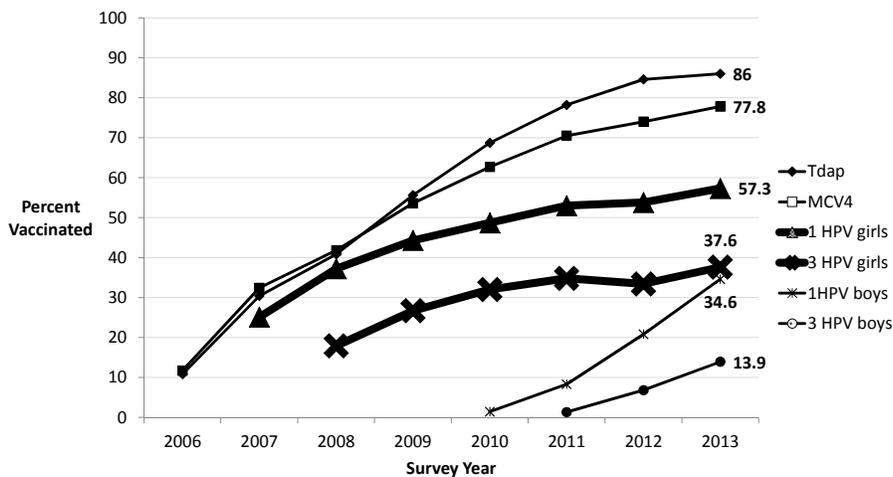
National Immunization Survey-Teen (NIS-Teen) 2006 vs. 2007



CDC. National and State Vaccination Coverage Among Adolescents Aged 13-17 Years — United States, 2012
MMWR 2013; 62(34):685-693.



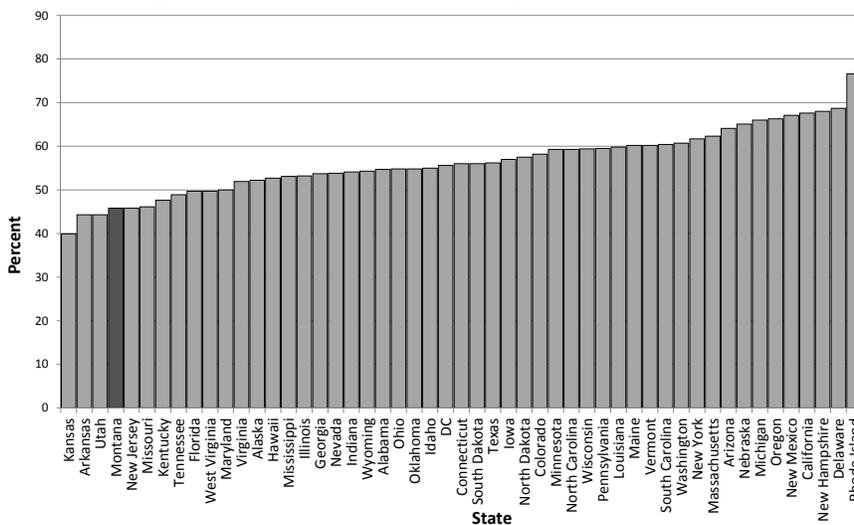
Adolescent Vaccination Coverage United States, 2006–2013



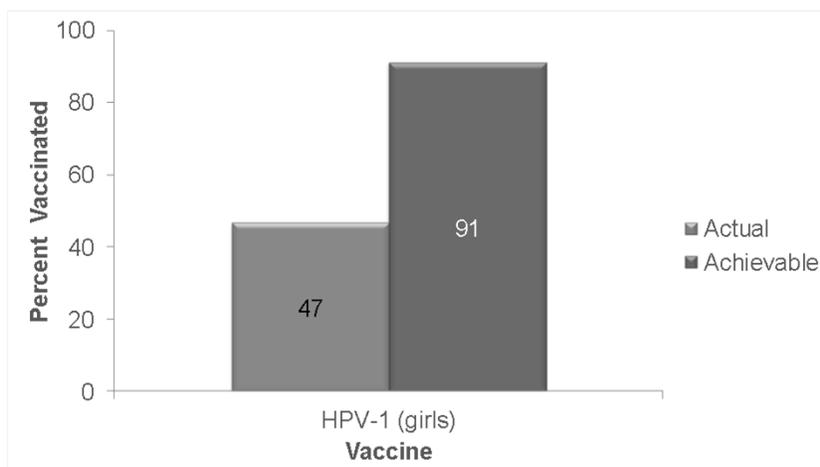
MMWR 2014; 63(29):625-633.



HPV Vaccine Series Initiation Among Females Aged 13-17 Years, by State, 2013



Impact of Eliminating Missed Opportunities by Age 13 Years in Girls Born in 2000



Missed opportunity: Healthcare encounter when some, but not all ACIP-recommended vaccines are given. HPV-1: Receipt of at least one dose of HPV.

MMWR. 63(29):620-624.



- 26 million:** number of girls under 13 years of age in the United States
- 168,400:** number who will develop cervical cancer if none are vaccinated
- 54,100:** number will die from cervical cancer if none are vaccinated

For each year we stay at 30% coverage instead of achieving 80%

- 4,400:** number of future cervical cancer cases we will not prevent
- 1,400:** number of cervical cancer deaths we will not prevent

Adapted from Chesson HW et al, Vaccine 2011;29:8443-50



Evidence-based strategies to improve vaccination coverage

- ▶ **Reminder/recall system**
 - ▶ Provider level (e.g., EMR prompts)
 - ▶ Parent/patient level (e.g., postcards, telephone calls, text messaging)
- ▶ **Standing orders**
- ▶ **Provider assessment and feedback**
 - ▶ Assessment of vaccination coverage levels within the practice and discussion of strategies to improve vaccine delivery
- ▶ **Immunization information systems (imMTrax)**

www.thecommunityguide.org/vaccines/universally/index.html



Suggestions to Improve Your Immunization Services



Following are several ideas that healthcare professionals and practices can use to improve their efficiency in administering vaccines and increase their immunization rates. Read each idea and check the response that applies to your work setting.

- Yes = We already practice this.
- No = We don't like this idea, or it couldn't work in our practice setting.
- Partly = We do some of this (or do it sometimes); we will consider it.

	Yes	No	Partly		Yes	No	Partly
1. In all exam rooms, we post the current, official U.S. immunization schedule for children and/or adults or variations thereof (for example, the official schedule of a medical society or of a state health department).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9. Prior to patient visits, we review the immunization record for each patient and flag charts of those who are due or overdue.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. We use the official "catch-up" schedule for children for advice on how to bring children up to date on their vaccinations when they have fallen behind.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10. We provide vaccination services during some evening and/or weekend hours.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. We are familiar with special vaccination recommendations for high-risk patients (e.g., special groups who need hepatitis A, hepatitis B, pneumococcal, influenza vaccines).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11. Patients can walk in during office hours for a "nurse only" visit and get vaccinated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. When scheduling appointments, we remind patients/parents to bring along their (or their	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12. We use all patient encounters (including acute-care and follow-up visits) to assess and provide vaccinations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
				13. Whenever a patient comes in, the staff routinely asks to see his/her immunization record to determine if the patient received vaccinations at another healthcare site.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
				14. If a patient tells us "I'm up to date with my	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

cdc.gov/vaccines/programs/afix/index.html



Talking about HPV vaccine

FRAMING THE CONVERSATION



HPV Vaccine Communications During the Healthcare Encounter

- ▶ HPV vaccine is often presented as 'optional' whereas other adolescent vaccines are recommended
- ▶ Some expressed mixed or negative opinions about the 'new vaccine' and concerns over safety/efficacy
- ▶ When parents expressed reluctance, providers were hesitant to engage in discussion
- ▶ Some providers shared parents' views that teen was not at risk for HPV and could delay vaccination until older

Goff S et al. Vaccine 2011;10:7343-9
Hughes C et al. BMC Pediatrics 2011;11:74
Goff S et al. Vaccine 2011;10:7343-9
Hughes C et al. BMC Pediatrics 2011;11:74



Is she really too young? Take 1 (a conversation you may be familiar with)

Provider: Meghan is due for some shots today: Tdap and the meningococcal vaccine. There is also the HPV vaccine...

Parent: Why does she need an HPV vaccine? She's only 11!

Provider: We want to make sure she gets the shots before she becomes sexually active.

Parent: Well I can assure you Meghan is not like other girls—she's a long way off from that!

Provider: We can certainly wait if that would make you feel more comfortable.



Framing the HPV Vaccine Conversation

Tips and Time-savers for Talking with Parents about HPV Vaccine

Recommend the HPV vaccine series the same way you recommend the other adolescent vaccines. For example, you can say "Your child needs these shots today," and name all of the vaccines recommended for the child's age.

Parents may be interested in vaccinating, yet still have questions. Taking the time to listen to parents' questions helps you save time and give an effective response. CDC research shows these straightforward messages work with parents when discussing HPV vaccine—and are easy for you or your staff to deliver.



CDC RESEARCH SHOWS: The "HPV vaccine is cancer prevention" message resonates strongly with parents. In addition, studies show that a strong recommendation from you is the single best predictor of vaccination.

TRY SAYING: HPV vaccine is very important because it prevents cancer. I want your child to be protected from cancer. That's why I'm recommending that your daughter/son receive the first dose of HPV vaccine today.

CDC RESEARCH SHOWS: Disease prevalence is not understood, and parents are unclear about what the vaccine actually protects against.

TRY SAYING: HPV can cause cancers of the cervix, vagina, and vulva in women, cancer of the penis in men, and cancers of the anus and the mouth or throat in both women and men. There are about 26,000 of these cancers each year—and most could be prevented with HPV vaccine. There are also many more precancerous conditions requiring treatment that can have lasting effects.

CDC RESEARCH SHOWS: Parents want a concrete reason to understand the recommendation that 11–12 year olds receive HPV vaccine.

TRY SAYING: We're vaccinating today so your child will have the best protection possible long before the start of any kind of sexual activity. We vaccinate people well before they are exposed to an infection, as is the case with measles and the other recommended childhood vaccines. Similarly, we want to vaccinate children well before they get exposed to HPV.

CDC RESEARCH SHOWS: Parents may be concerned that vaccinating may be perceived by the child as permission to have sex.

TRY SAYING: Research has shown that getting the HPV vaccine does not make kids more likely to be sexually active or start having sex at a younger age.





URGENT CALL TO PREVENT CANCER – TAKE THE HPV VACCINE CHALLENGE

YOUR HELP IS NEEDED TO INCREASE HPV VACCINATION RATES
Health care providers and public health professionals in Massachusetts and across the country have started a campaign to dramatically increase adolescent vaccination rates against HPV. For each year we stay at current vaccination rates, girls and boys will go on to acquire cervical, oral, anal and other HPV-related cancers.

THE PROBLEM
Our three-dose HPV vaccine coverage has stagnated at 33% nationally and missed opportunities for vaccination are high. The CDC, AAP and AAFP recommend that all 11-12 year-olds receive HPV, meningococcal, and Tdap vaccines together.

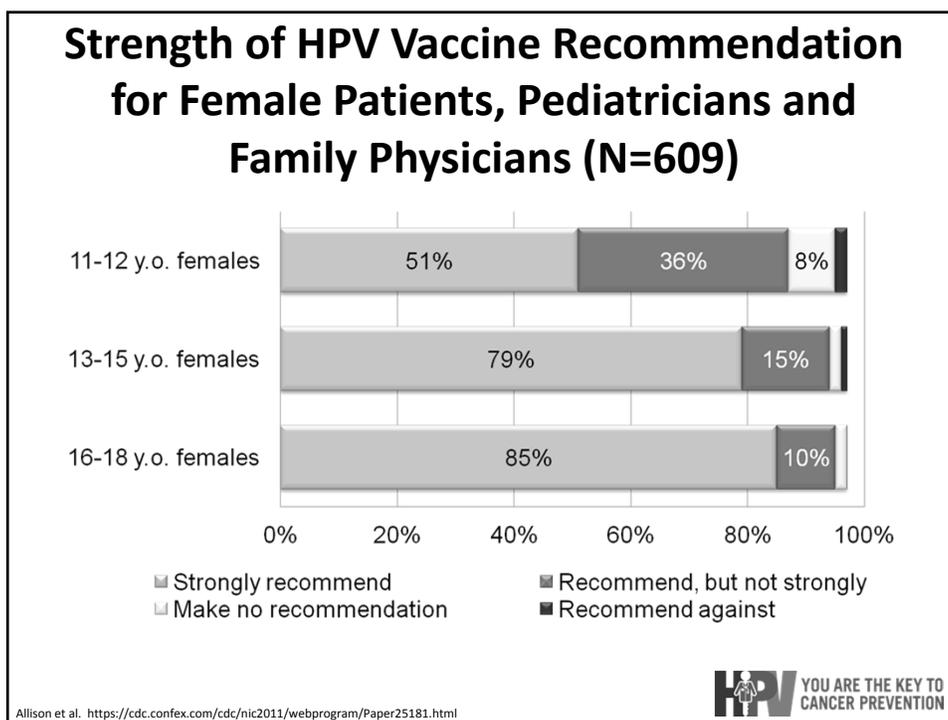
WHAT CAN PROVIDERS DO?
The most significant factor in parents' decision to vaccinate their children with HPV vaccine is a clear, brief, and strong recommendation from the child's healthcare provider. Research shows that simply changing the wording used to introduce the HPV vaccine makes a tremendous difference. Try changing your discussion for one week, and see how it improves your vaccine acceptance.

Providers: TAKE THE HPV VACCINE CHALLENGE	Start your vaccine discussion with all 11 and 12 year-olds and their parents by saying: "Your child needs 3 vaccines today – HPV, Tdap, and meningococcal."
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This simple change works because by putting HPV first, parents perceive that it's a normal, recommended vaccine, not a controversial or optional vaccine. CDC provides a "Tips and Time-savers for Talking with Parents about HPV Vaccine" resource that translates research into effective communication tools:
<http://www.cdc.gov/vaccines/who/teens/for-hcp-tipsheet-hpv.pdf>



**YOU ARE THE KEY TO
CANCER PREVENTION**



HPV Transmission

- ▶ **Almost everyone will be infected but most people will never know**
- ▶ **47% of high school students have already engaged in sexual (vaginal-penile) intercourse**
 - ▶ 6% of students had sexual intercourse before age 13
 - ▶ 1/3 of 9th graders and 2/3 of 12th graders have engaged in sexual intercourse
 - ▶ 1 in 7 high school students (all grades) have had sexual intercourse with 4 or more partners

Jemal A et al. J Natl Cancer Inst 2013;105:175-201
Kahn. MMWR. 2014; 63(4)



Addressing all concerns in 45 seconds

Provider: Meghan is due for some shots today: HPV, meningococcal vaccine, and Tdap.

Parent: Why does she need an HPV vaccine? She's only 11!

Provider: The HPV vaccine will help protect Meghan from cancer caused by HPV infection. We know that HPV infection is dangerous— 33,000 people in the US get cancer from HPV every year. And we know that the HPV vaccine is safe— over 100 million doses have been given and there haven't been any serious side effects attributable to the vaccine.

Parent: But it just seems so young...

Provider: Vaccines only work if they're given before exposure— we never wait until a child is at risk to give any recommended vaccines. HPV vaccine is also given when kids are 11 or 12 years old because it produces a better immune response at that age. That's why it is so important to start the shots now and finish all 3 of them in the next 6 months.



Clear, Concise, and Consistent Communication

HPV VACCINE MESSAGES



1. HPV Vaccine Is Safe, Effective, and Provides Lasting Protection

A. HPV Vaccine is SAFE

- ▶ No serious sides effects
- ▶ HPV vaccine safety similar to MCV4 and Tdap vaccine safety

B. HPV Vaccine WORKS

- ▶ Decline in genital warts in Australia
- ▶ Prevalence of vaccine types declined by 56% in U.S.

C. HPV Vaccine LASTS

- ▶ No evidence of waning immunity



Garland et al, Prev Med 2011; Ali et al, BMJ 2013; Markowitz JID 2013; Nsouli-Maktabi MSMR 2013

2. HPV Vaccination is best at 11 or 12 years

A. HPV vaccine works best when the entire series has been given before exposure to HPV

- ▶ Very little exposure to HPV at 11 and 12 years of age
- ▶ 1/3 of 9th graders and 2/3 of 12th graders have engaged in sexual intercourse
- ▶ 24% of high school seniors have had sexual intercourse with four or more partners

B. Higher immune response from HPV vaccine in preteens than in older teens



3. HPV Vaccination Rates have Plateaued

A. Stagnant HPV vaccination rates are leaving another generation vulnerable to devastating HPV cancers

- ▶ Most of these cancers could be prevented with vaccination

B. HPV vaccination rates are lagging behind the rates of the other vaccines for preteens and teens

- ▶ In 2012, 8 in 10 girls who had not yet started the HPV vaccine series saw a healthcare provider and received at least one vaccine, but not HPV vaccine; if these girls all received HPV vaccine, first dose coverage could be 93%

C. High HPV vaccination coverage is possible with the current healthcare structure



High-Impact Statements

- ❖ **HPV cancers are devastating to men and women**
 - This is especially true for the cancers that are not routinely screened (cancers of the anus, mouth/throat, penis, vagina, and vulva); these cancers are difficult to treat and can result in tremendous pain, disfigurement, and even death
- ❖ **We finally have a vaccine for cancer**
 - Yet only one third of girls have finished the HPV vaccine series
- ❖ **How often do we really get the chance to prevent cancer?**
 - *HPV vaccine is cancer prevention.*



Review

1. **Give a STRONG recommendation**
 - Ask yourself, how often do you get a chance to prevent cancer?
2. **Start conversation early and focus on cancer prevention**
 - Vaccination given well before sexual experimentation begins
 - Better antibody response in preteens
3. **Offer a personal story**
 - Own children/Grandchildren/Close friends' children
 - HPV-related cancer case
4. **Welcome questions from parents, especially about safety**
 - Remind parents that the HPV vaccine is safe and not associated with increased sexual activity





**HPV VACCINE
IS
CANCER PREVENTION**
And YOU are the key!



**For more information,
including free resources for yourself
and your patients/clients, visit:
cdc.gov/vaccines/YouAreTheKey**

**Email questions or comments to
CDC Vaccines for Preteens and Teens:
PreteenVaccines@cdc.gov**



HPV Vaccine Resources for Healthcare Professionals



HPV Vaccine is Cancer Prevention

Overview Tools for Your Practice Handouts to Give to Patients & Parents

You Are the Key to HPV Cancer Prevention



Watch a short video to remind you why YOU are the key to preventing HPV-related cancers. [5:35 mins]

• HPV is so common that almost everyone will be infected with HPV at some point in their lives; however most people will never know they have been infected.

Resource Spotlight



Understanding the Burden of HPV-Related Cancers [1.51MB]



Tips for Talking to Parents about HPV Vaccine [1 page]

Customize this slideout for presentations on HPV and HPV vaccination.

cdc.gov/vaccines/YouAreTheKey

