

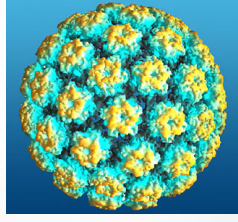
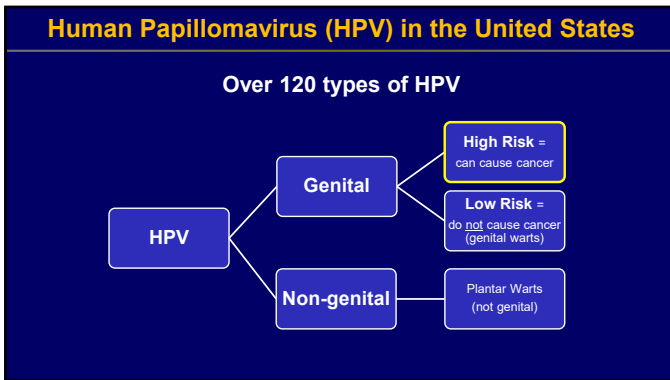


Reducing the Burden of HPV-related Cancers
Building Momentum in Primary Care



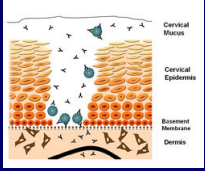
Supported by an educational grant from Merck & Co., Inc.  Jointly provided by Center for Independent Healthcare Education and Vemco MedEd

HPV Vaccine
Cancer Prevention

HPV Durability

- Induce persistent infection without early serious complications to host
 - HPV infects where normal cell layers of epidermis are disrupted
 - Able to evade acute immune system response
 - Minimal inflammation, no blood viremic phase, infection exclusively epithelial (poor access to immune responses)
- Shed virions for transmission
- Despite this, ~90% of infections are cleared by innate immune system




National Cancer Institute. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2811186/>

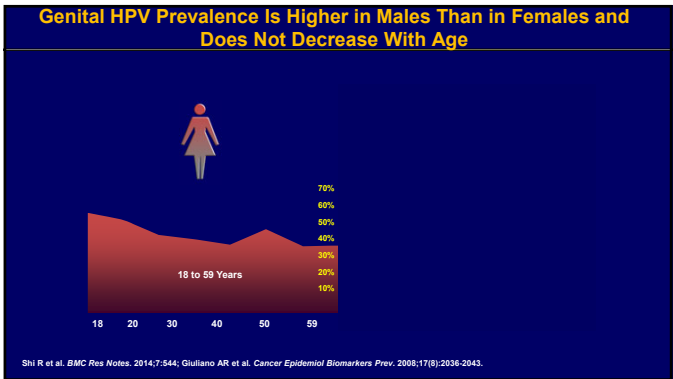
HPV in the United States

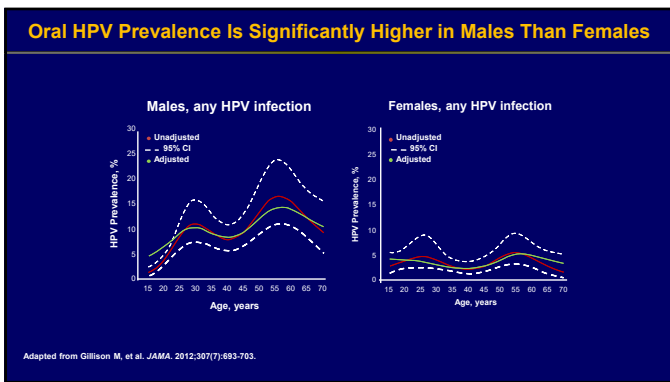
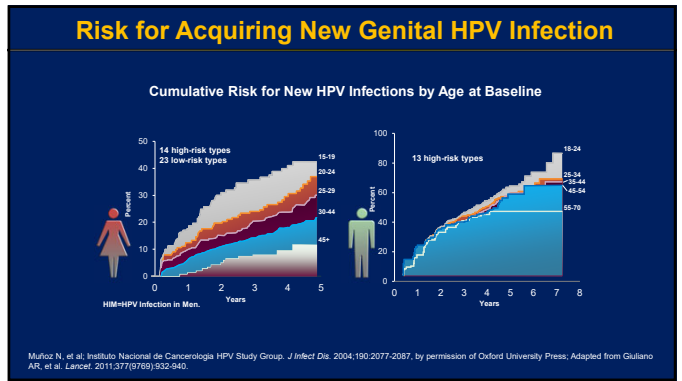
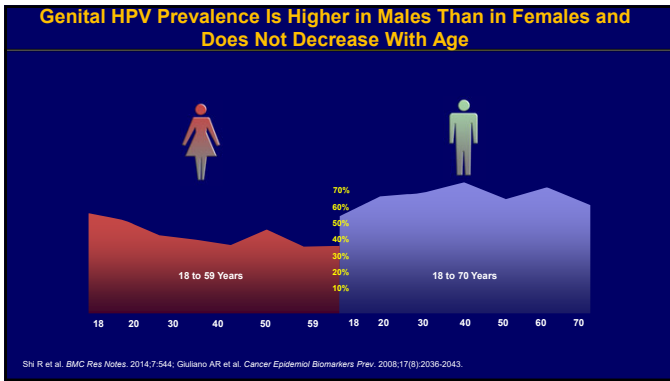
HPV is the most common sexually transmitted infection in the U.S.

- Over 6.2 million new infections every year
- Nearly three-fourths new infections in 15–24 yo



Dunne EF, et al. JAMA. 2007;297:813-819.





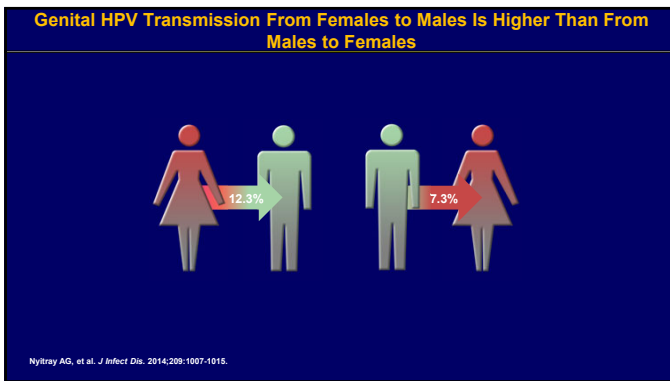
Transmission of HPV

Surface-to-surface contact!

HPV can spread through anogenital region

- Condoms only partially effective in prevention
- Some adolescents found to test positive for vaginal HPV prior to first vaginal sexual intercourse

Shew ML, et al. *J Infect Dis*. 2013;207:1012-5.



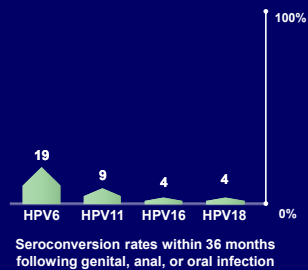
Very Few Adults Have Natural Antibodies to HPV Types in the HPV9 Vaccine

18% SEROPOSITIVE TO 2+ OF THE 9 VACCINE HPV TYPES (NHANES 2005-2006, ages 14-59 years)

5%

NHANES, National Health and Nutrition Examination Survey. Liu G, et al. *J Infect Dis*. 2016;213(2):191-198.

Males Have a Low Rate of Seroconversion Following Infection...



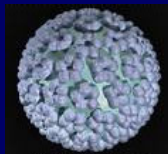
Giuliano AR, et al. *Papillomavirus Res.* 2015;1:109-115.

Males Who Do Seroconvert May Not Be Protected

- Study to measure if naturally-induced serum antibodies against HPV impact risks of subsequent genital infections by HPV 6, 11, 16, or 18 in men
- Baseline serostatus among men was *not* associated with a reduction in subsequent genital HPV 6, 11, and 16 infections

Pamiani SJ, et al. *Cancer Res.* 2016;76(20):6066-6075.

HPV is Ubiquitous



Dumma EF, et al. *JAMA.* 2007;297:813-819.
 CDC Pink Book. Available at: www.cdc.gov/vaccines/pubs/pinkbook/hpv.html.

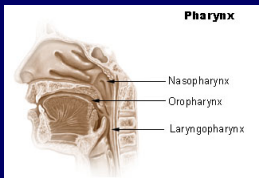
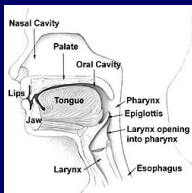
HPV-Related Cancers in the United States

Cancers Caused by HPV in United States

- >99% of cervical cancers
- 60-70% of oropharyngeal cancers
- 91% of anal cancers
- 75% of vaginal cancers
- 69% of vulvar cancers
- 63% of penile cancers

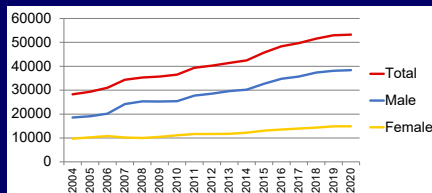
Balley HH, et al. *J Clin Oncol.* 2016;34(15):1803-1812. Available at: <http://jco.ascopubs.org/content/early/2016/04/07/JCO.2016.67.2014.full>.

Oropharyngeal Cancer



Base of the tongue, the tonsils, the soft palate, and the walls of the pharynx

Incidence of Oropharyngeal Cancers

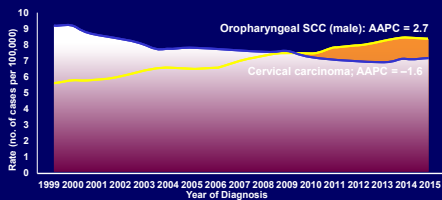


Incidence of HPV-related oropharyngeal carcinomas are **increasing**

- Particularly among males (3 × more common)
- 70+% positive for HPV 16

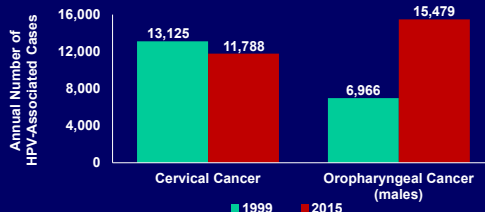
American Cancer Society. *Cancer Facts & Figures*. 2004-2020. www.cancer.org

Incidence of cervical cancer declining,
Incidence of HPV-related oropharyngeal squamous cell
carcinomas (SCCs) is increasing



AAPC, average annual percent change; SCC, squamous cell carcinoma.
CDC's National Program of Cancer Registries; National Cancer Institute's Surveillance, Epidemiology, and End Results program, as cited in Van Dyne EA, et al. *MMWR Morb Mortal Wkly Rep.* 2016;67(33):918-924.

Over the past 15 years, incidence of
HPV oropharyngeal squamous cell carcinoma doubled



Van Dyne EA, et al. *MMWR.* 2016;67:918-924.

HPV Oropharyngeal Cancers in US

- Transmission is oral sex
 - Though not completely understood
- Why increase in younger individuals?
 - Different sexual norms
 - Oral sex at an earlier age
 - Decrease in other tobacco-related cancers
- Greater prevalence in men?
 - HPV burden in cervix greater than penis

Cancer Facts and Figures 2012, American Cancer Society. www.cancer.org
Chaturvedi AK, et al. *Clin Oncol.* 2008;20:432-439.
Jemal A, et al. *J Natl Cancer Inst.* 2013;105:175-201.
Manor S, et al. *Lancet Oncol.* 2010;11:781-789.

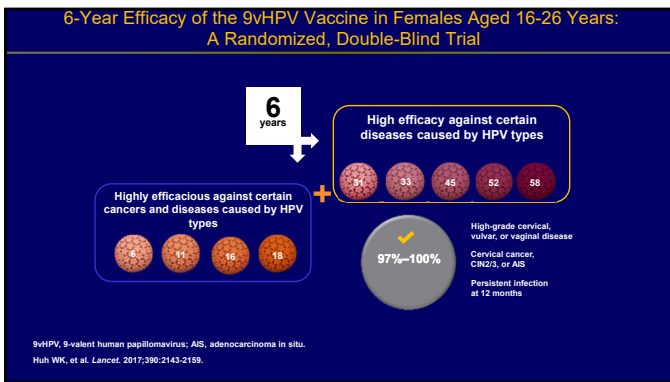
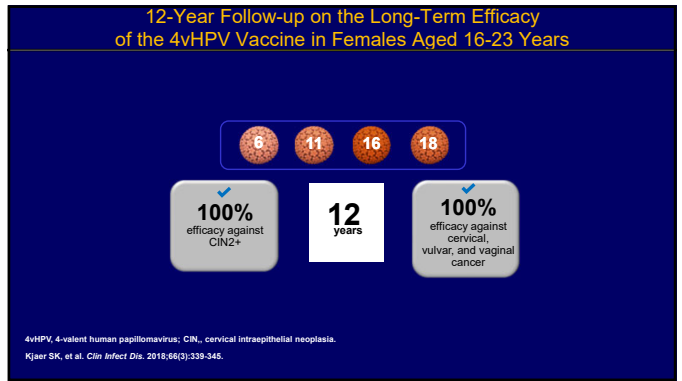
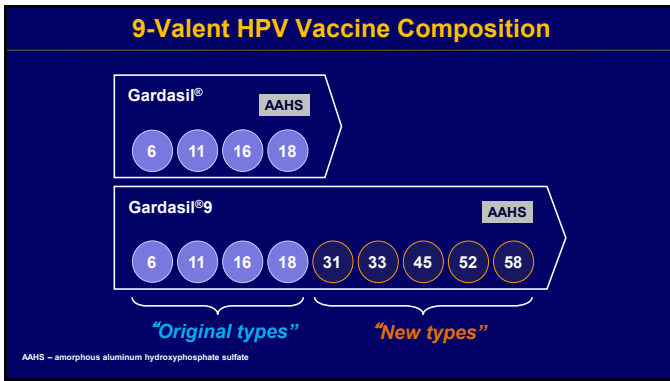
HPV Vaccine and Sexual
Behaviors



HPV Prevention: Vaccination



- HPV2 — Cervarix (GSK)
- HPV4 — Gardasil (Merck)
- HPV9 — Gardasil 9 (Merck)



- ### HPV Vaccine Safety
- >350 million doses of HPV vaccine distributed worldwide
 - Most common adverse events are mild: Sore arm, myalgias
 - Among serious adverse events: **No** patterns to suggest any events related to the HPV vaccine
 - Findings similar to the safety of all other adolescent vaccines
- Slade BA et al. *JAMA.* 2009;302(7):750-757; Centers for Disease Control and Prevention. Questions about HPV vaccine safety. <https://www.cdc.gov/vaccinesafety/vaccines/hpv/hpv-safety-faqs.html>. Last Reviewed December 11, 2019. Accessed January 15, 2020.

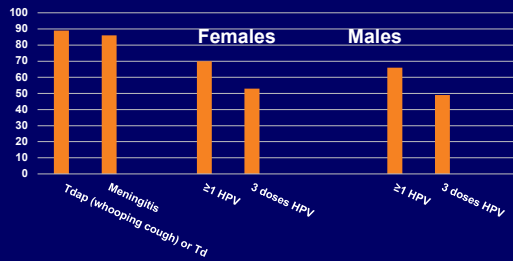
Vaccine Recommendations

HPV vaccine should be offered to all adolescents and young adults *regardless* of:

- Sexual history
- History of abnormal Pap
- History of HPV positive Pap
- Sexual orientation



U.S. HPV Vaccination Rates



Walker TV, et al. *MMWR*. 2019; 68(33):718-723.

HPV Vaccine Recommendations: ACIP Update

- HPV vaccination recommended for both males and females through age 26 years
 - Target age 11-12 years
 - Can start as early as age 9
 - If <15 years of age: **2 doses**
 - If >15 years of age: **3 doses**
- For ages 27 to 45 years: decision to vaccinate based on *shared decision-making*

Recommendations based on June 2019 ACIP meeting. www.cdc.gov/vaccines/acip/meetings/downloads/legends-archives/legends-2019-06-098.pdf. Accessed January 15, 2020.

FDA Label Expansion

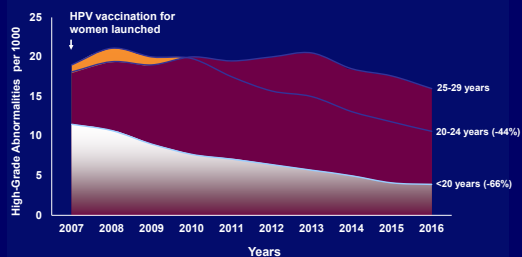
June, 2020 the FDA expanded indication for Gardasil 9 to include prevention of oropharyngeal disease



www.fda.gov/media/90064/download

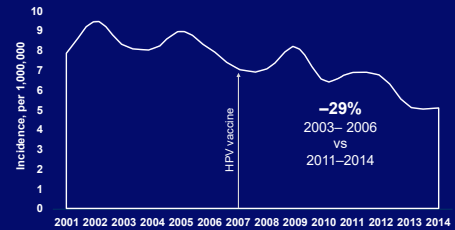
Clinical Outcomes

Australia: Trends in High-Grade Cervical Abnormalities by Age Pre- and Post-Vaccination



Kirby Institute. HIV, viral hepatitis and sexually transmissible infections in Australia: annual surveillance report 2018. Sydney: Kirby Institute, UNSW Sydney, 2018. <https://kirby.unsw.edu.au/report/hiv-viral-hepatitis-and-sexually-transmissible-infections-australia-annual-surveillance>.

USA: Trends in Cervical Cancer Incidence Among 15- to 24-Year-Old Females



Guo F, et al. *Am J Prev Med*. 2018;55:197-204.



- ### WHO: 10 Threats to Global Health in 2019
1. Air pollution and climate change
 2. Noncommunicable chronic disease
 3. Global influenza pandemic
 4. Fragile and vulnerable settings
 5. Antimicrobial resistance
 6. Ebola and other high-threat pathogens
 7. Weak primary health care
 8. **Vaccine hesitancy**
 9. Dengue
 10. HIV
- Available at: <https://www.who.int/emergencies/ten-threats-to-global-health-in-2019>.

Strategies to Improve Vaccination

- ### How We Present the Vaccine: Considerations
- “Sex during adolescence is for other peoples kids”*
- #1: Parents do not want to think about their kids being sexually active
 - #2: Immunization 101: Vaccines can only prevent disease you have not yet had
 - Important to immunize **before** exposure
 - Most parents do not know how immunizations work

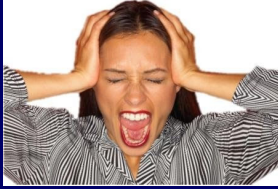
How We Present the Vaccine: Solutions

Potential Solutions

Approach to Avoid: A Focus on Sex

“HPV stands for human papillomavirus and causes genital warts and cervical cancer. It is a sexually-transmitted disease. Many kids become sexually active by age 15.

Do you want this vaccine for your daughter?”



Approach to Consider: *Less is More*

"Today your son is due for three routine vaccines which include HPV, meningitis vaccine; and Tdap. Someone will be right in to administer those vaccines and I look forward to seeing you next year."

Approach to Consider: *Less is More*

If questions arise about the HPV vaccine:

"Has anyone that you care about had cancer?"

"What was it like for them? For you?"

"We can reduce the chances of your son having a cancer experience. Do you want to reduce the chances of your son having cancer?"

HPV: A Life Course Infection

Prevention during adolescence and young adulthood

Disease during early adulthood

Infection . . . Anytime!

Encourage Prevention

